

JPRS-TND-88-004  
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**FOREIGN  
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# ***JPRS Report***

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# **Nuclear Developments**

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# Nuclear Developments

JPRS-TND-88-004

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29 FEBRUARY 1988

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**Commons Report Urges Halt to Nuclear Power Plant Building**

51200012 Toronto *THE GLOBE AND MAIL* in English 20 Jan 88 p A8

[Text] The federal Government should declare a moratorium on the construction of nuclear power plants in Canada, a Commons committee said yesterday in a unanimous report.

The report also calls for Environment Canada to assume responsibility for many aspects of the nuclear industry, including jurisdiction over the Atomic Energy Control Board, which currently reports to the Minister of Energy.

The 45-page document, which follows a series of hearings last year by the Commons environment committee, makes 15 recommendations on steps Canada should take to cope with the burgeoning amount of highly radioactive waste being produced by the country's 19 power reactors.

While some components of that waste have a half-life of less than a week, others—such as one form of plutonium—have a half-life of 387,000 years.

By the end of last year, Canada had generated 12,400 tonnes of spent reactor fuel, the committee said. By 2024, the total amount of radioactive waste will have reached 100,000 tonnes.

"This takes on very great importance indeed, in light of the fact that there is still no proven method for disposing of these dangerous byproducts," the committee said in a news release.

The spent fuel is being stored temporarily in pools of water at the reactors.

Atomic Energy of Canada Ltd. has been conducting research on methods for permanent disposal of the waste. Most of that research focuses on the possibility of burying it in deep caverns bored in the granite of the Canadian shield in Ontario or Manitoba.

In the report, titled *The Eleventh Hour*, committee members make a number of other recommendations:

— A moratorium should be imposed on nuclear reactor construction until there is an acceptable solution to the waste-disposal issue.

— AECB should be required to involve the public in decisions "on moral or ethical questions," to include on its board of directors people who "reflect more fully the reservations expressed by the public about nuclear energy" and to report to Environment Canada rather than the Energy Department.

— Environment Canada should prepare to defend "the environmental standpoint" in the development of a waste-management program.

— The provinces that produce nuclear waste—Ontario, Quebec and New Brunswick—should bear primary responsibility for storing it.

— The federal Government should take steps to encourage Canadians to conserve energy by using it as efficiently as possible and should determine ways to increase the proportion of Canadian energy generated using renewable resources such as hydro or solar power.

07310

**Premature Tube Deterioration Found at Pickering Reactor**

51200014 Windsor *THE SATURDAY WINDSOR STAR* in English 16 Jan 88 p D14

[Text] Toronto (CP)—Crucial components of the Candu reactors at the Pickering Nuclear Generating Station are deteriorating faster than expected, raising the possibility of expensive replacements, according to a spokesman for Atomic Energy of Canada Ltd.

A routine inspection last September discovered premature deterioration of a tube used to hold nuclear fuel in the No 3 reactor core, said Zygmund Domaratski, head of reactor regulation at the federal watchdog agency.

The same kind of deterioration caused Canada's most serious nuclear accident in August 1983, when a tube carrying white-hot bundles of uranium fuel ripped open in Pickering reactor No 2.

The rupture sent thousands of litres of boiling radioactive water gushing out of the reactor.

Reactors No 1 and No 2 were gutted and rebuilt using new tubes made of superior materials that Ontario Hydro officials predicted would not deteriorate as quickly.

The four-year project cost \$441 million. But the degree of deterioration in the new type of tube used in all four reactors, "was somewhat higher than we had expected," said William Morison, a designer of the Canadian-built Candu reactor and vice-president of design and development at Ontario Hydro.

The weakened tube discovered in No 3 reactor—one of 390 pressure tubes in the reactor's core—was replaced with a new one.

Ontario Hydro and AECL have also inspected 20 tubes in reactor No 4 and preliminary results show far less deterioration, said Morison. He said final results will not be available for about two months and the inspection program will continue through 1988. He said the discovery is being considered "an alert" that other unforeseen problems may develop within the predicted lifetime of the tubes.



Domaratzki said the findings raise questions about how long the 15-year old reactors can operate safely before they have to be gutted and rebuilt with new tubes—at a cost of hundreds of millions of dollars. The components were predicted to last 25 years.

He added that the federal agency cannot predict how much longer the tubes could deteriorate before they would be dangerous.

07310

#### **AECB Safety Role Seen in Nuclear Submarine Construction**

51200013 Toronto *THE GLOBE AND MAIL* in English 11 Jan 88 p B7

[Article by Ken Romain]

[Text] The Atomic Energy Control Board, which licences all civil nuclear activity in the country, is expected to play an influential military role in approving sites selected by the Department of National Defense for construction of nuclear-powered submarines for the Canadian Forces and for ensuring nuclear safety.

Although the board's position still has not been clearly defined, discussions are under way to establish the terms of AECB's participation in the \$8 billion submarine program. The nuclear reactors, which will be fueled by enriched uranium, will be installed by the Canadian shipyards selected to build the vessels.

"We have been told by the Department of National Defence that in order to ensure a high level of safety they wish to have the AECB involved in the construction and operation of the nuclear submarines," said Zigmund Domaratzki, the board's director-general of reactor regulation.

"We have never been involved like this before. But with something this big we don't want to go into it in all ill-defined fashion. Once we agree on what the responsibilities of each will be, then our role will be clear. At the moment it is not. All we know is that DND wants us involved in the program."

The AECB administers and enforces the regulations of the Atomic Energy Control Act and licences all uses of radioactive materials and activities involving nuclear energy, such as the nuclear-fired power plants, in Canada.

There are legal experts, however, who argue that the act's regulations do not apply to the military and that the navy can build its nuclear-powered submarines wherever it wants to build them.

There is also a legal opinion that the regulations do apply and that the navy must conform to the act's safety regulations.

To sidestep controversy, the department took the prudent course and asked the AECB to advise it on the acceptability of the sites selected for the construction and maintenance of the vessels.

In addition to shipyards, the sites will include the bases to be established on the East and West coasts from which the submarines will operate and the main maintenance base where the vessel will be refitted and their reactors refueled.

"I expect that our role would include looking at the sites to see whether they are a safe place or whether there are impediments," Mr Domaratzki said.

The department has said it intends to buy 10 to 12 nuclear submarines. The reactors of the two vessels competing for the Canadian contract, the British-built Trafalgar-class submarine and the French-built Rubis-class submarine, are fueled with enriched uranium.

The Defence Department now operates for experimental purposes a small Slowpoke nuclear reactor generating 20 kilowatts at the Royal Military College in Kingston, Ontario, which the AECB licenced.

Mr Domaratzki said that in addition to overseeing reactor construction and installation, the board will watch for potential hazards both man-made and natural (such as the earthquake stability of the area) in which the operations are located.

"Earthquake stability is very important. That doesn't make a very big difference in Ontario or in Nova Scotia, but on the West Coast there are places where earthquake stability would be significant.

"For a power reactor that is a major consideration, but the question would not be quite as important for building submarines or a base for submarines because the structures are not the same thing."

The AECB would also look at possible external hazards. At Darlington, Ontario, the site of an Ontario Hydro nuclear power plant, board officials had noticed that a rail line ran nearby.

"We asked what happens if a train carrying a load of dynamite explodes as the train is going by, so they built an embankment between the rail line and the site."

There are also man-made hazards "certainly when you get into submarines. One of the things you are looking at is shipping lanes, and are you likely to have a collision with a large oil tanker or something that could cut you in half?"

"If your vase is in a harbor, are there many people around and how many would be affected if there was some kind of release of radioactivity? These are things DND will have to look at in the site selection stage."

07310

## HONG KONG

### Report Covers Local Plans for Daya Bay Nuclear Accident

51400003 Hong Kong Hong Kong STANDARD in English 1 Jan 88 p 1

[Article by Wilson Wong: "We 'Will Be Ready' for N-Accident"]

[Text] Hong Kong will be ready to deal with a nuclear accident at China's Daya Bay plant, if recommendations from a specially-commissioned report are implemented.

Contingency plans drawn up by the United Kingdom Atomic Energy Authority at Harwell say at least 16 government departments would be involved in any nuclear emergency just across the border.

But the report points out that more efficient communication is needed between various departments involved in the operation.

The report also rejects the need for an overall evacuation plan because it says the nuclear plant is 50 kilometres from Hong Kong.

It has been said many times that evacuation would not be necessary and it was stated clearly in the report, THE STANDARD has learnt.

The Government received the final draft of the nuclear accident contingency plan a week ago.

But the report will not be made public until next month because of printing and translation technicalities.

A government official, who would not be named, said yesterday: "There is no need to establish new departments to deal with a potential disaster. We only need to build up the emergency task force from the existing structure.

"The departments concerned will be given additional duties in case of a nuclear accident, but they will not need additional manpower.

"It is a matter of gearing the job so all parties will function together in the event of an emergency.

"The entire system will be tested regularly."

The Secretary for Economic Services, Mrs Anson Chan, will chair the coordinating committee, which will mobilise the government departments concerned.

The departments include the Royal Observatory, the Water Supplies Department, the Agriculture and Fisheries Department, the Medical and Health Department, as well as divisions under the Municipal Services Branch.

The Agriculture and Fisheries Department will check agricultural products for radiation.

The Water Supplies Department will monitor the reservoirs to guarantee a safe water supply.

The Medical and Health Department will be responsible for storing and administering iodine to counter the effects of radiation poisoning.

The Municipal Services Branch will test imported food from neighbouring farmlands and local markets.

The disciplinary forces such as the police and fire services will be responsible for maintaining social order and providing manpower.

Various government departments have received the contingency plan for comment, but all were told to keep the contents confidential until it is disclosed publicly.

The principal assistant secretary of Economic Services, Mr John Wilson, said it was not desirable to release the details of the report at the moment.

But he said implementation of the contingency plan would not cost the Government a significant amount, but he would not say how much.

Sources said the report recommends that the Government buys detection equipment to monitor radioactivity in the air, and in food and water.

The Harwell report was due to come out last August, but it was delayed for 6 months before it could be released to the Government.

The consultant will continue to carry out the final study, assessing the risks of the Daya Bay nuclear plant itself.

"As the contract of the equipment and the details of the plant have been known, it is time for the consultant to assess the safety measures at the plant," Mr Wilson said.

Sources said the final study would probably say the safety measures in the plant were sufficient.

This report is scheduled to come out in 1989.

/9604

## JAPAN

### Function Tests Begin on Nuclear-Powered Ship

51600017 Tokyo KYODO in English

0724 GMT 1 Feb 88

[Text] Aomori, 1 Feb (KYODO)—A semigovernment research institute began function tests on Japan's first nuclear-powered ship, the "Mutsu," on Monday for the first time in 14 years at its new home port of Sekinehama in Mutsu, Aomori Prefecture, institute officials said.

The Japanese Atomic Energy Research Institute will conduct test on the 8,242-ton ship over the next two months to inspect the vessel's nuclear reactor equipment.

The "Mutsu," inactive since a radiation leak during its maiden voyage in August 1974, arrived at Sekinehama Port from Ominato Port, also in Mutsu, last Wednesday.

/9274

## YUGOSLAVIA

### **Rumors About Nuclear Research Institute Denied** *LD081726 Zagreb Domestic Service in Serbo-Croatian* 1400 GMT 8 Feb 88

[Excerpts] Josip Vrhovec, member of the Yugoslav Presidency, today visited his constituency, the Zagreb municipality of Medvescak. After talking with his hosts, he visited our biggest scientific and research institute, Rudjer Boskovic, and the INA-NAFTAPLIN work organization. Here is a report by Jasna Pavelic-Juresko:

[Begin recording] [Pavelic-Juresko] Constitutional changes and the economy were the main topics of discussion in Medvescak municipality.

At the Rudjer Boskovic Nuclear Research Institute, apart from the obvious discussion on the institute's role in scientific and technological development in Croatia, Josip Vrhovec was particularly interested in the institute's nuclear program, in view of the report that appeared in the West German magazine SPIEGEL and the media reaction to it. Dr Krunoslav Flis [title as received], the institute's director general, categorically denied these rumors, and stressed, among other things:

[Flis] As far as the Rudjer Boskovic Institute is concerned, it is most certainly an advanced technology center. Nuclear technology is one such technology. Of course, a special aspect of nuclear technology is its possible application for non-peaceful purposes. In this context, it must be stated clearly that the Rudjer Boskovic Institute is part of the Socialist Federal Republic of Yugoslavia which supports, and very actively too, the non-proliferation of nuclear weapons, and the SFRY has signed certain agreements on this. Yugoslavia is not working on any nuclear bomb whatsoever nor has she any ambitions to work on nuclear weapons or an atomic bomb production program. However, on the other hand, it is certainly true that we must monitor and concern ourselves with nuclear technology and master it for peaceful purposes. We must also keep abreast of the events in the world on the application of nuclear technology for militarist purposes.

[Pavelic-Juresko] In this context, stressed Josip Vrhovec, we must acquire knowledge, and the Rudjer Boskovic Institute must be open both to our citizens and to the international public. Its work must be organized, not haphazard.

Josip Vrhovec visited the work organization in the Medvescak area, INA-NAFTAPLIN. [end recording]



## ARGENTINA

### Heavy Water Leak Reported in Nuclear Plant

PY190231 Buenos Aires DYN in Spanish  
2324 GMT 9 Dec 87

[Text] Cordoba, 9 Dec (DYN)—It was officially reported today that there have been three consecutive leaks of several tons of heavy water containing radioactive material into the waters of Embalse Rio Tercero. This was disclosed to the local media by biologist Raul Montenegro, under secretary of the environment of the Cordoba provincial government.

Montenegro said that a "group of honorary defenders of the environment of Rio Tercero" sent him "a note stating that there was a small heavy water leak at the Embalse Nuclear Plant."

Montenegro added that "in light of this information, the under secretariat requested information from the National Commission for Atomic Energy (CNEA), which provided details on similar leaks in 1986 and 1987."

Montenegro said: "Heavy water is a nonradioactive material that is used in the primary circuit of the central cooling unit, which contains approximately 160 tons of heavy water."

He pointed out, however, "that the water and circuit are not completely isolated from what happens in the heart of the reactor; therefore, the water always contains some radioactive material."

Montenegro said that "when water leaks from the secondary circuit and goes to the tertiary circuit, which is the drainage into the waters of Embalse Rio Tercero, there is some leakage of radioactive material into the lake."

Montenegro added that from 17 February to 16 March 1986 "there was a heavy water leak in one of the pipes in steam generator No 3 at the Embalse Nuclear Power Plant," that "from late February to mid-March 1986 the leak ranged from 1.32 kg to 7.95 kg of heavy water per hour, and that, at that time, the CNEA reported that the leak remained below the discharge limit [limite de descarga] allowed by the operational license."

Montenegro stressed that "the largest amount of radioactive discharge (into the lake) was 23.6 percent of the limit authorized under the nuclear power plant's operational license," that "this radioactive discharge occurred on 15 March 1986, and that the damaged pipe was subsequently repaired."

Montenegro reported that the second leak occurred in mid-1987 "as a result of a punctured pipe in the steam generator, which caused the leakage of 790 kg of heavy water."

In this case, Montenegro said, the CNEA "stated that the yearly discharge limit had not been exceeded, either."

Montenegro emphasized that "the dissemination of this data is a break from the traditional secrecy surrounding nuclear activities." He said, however, that "there is a long way to go," and "we must never forget that the emission of radioactive material into the environment—even at internationally approved levels—represents a biological risk that must be known by the public."

## BRAZIL

### Abreu Sodre Denies Sales of Weapons to Iran

PY262327 Brasilia Domestic Service in Portuguese  
2100 GMT 26 Jan 88

[Text] Foreign Minister Abreu Sodre today denied that Brazil had sold any type of weapons to Iran, but confirmed that the government is closing a deal to supply weapons to Libya, for a possible total of \$2 billion.

Abreu Sodre said the weapons sales that are being negotiated with Libya involve only defensive weapons. He added that the rockets and missiles that Brazil will provide to Libya have very short ranges. Sodre made this remark at the Brasilia Air Base after returning from Suriname.

Sodre stressed that he did not know anything about U.S. Government displeasure concerning the commercial operation with Libya. According to a press report, the Reagan government protest was transmitted to the Brazilian ambassador in Washington, Marcilio Marques Moreira.

### Abreu Sodre on Arms Race, Nuclear Test Ban

PY190315 Brasilia Domestic Service in Spanish  
2200 GMT 18 Feb 88

[Text] In Geneva, Foreign Minister Abreu Sodre today proposed the creation of a special UN committee to negotiate a nuclear test ban. He is also seeking a treaty to guarantee the peaceful use of outer space. The proposals were introduced at the 10th UN Conference on Disarmament.

Abreu Sodre said all agreements must be safeguarded in order to guarantee peace.

[Begin Abreu Sodre recording] Brazil is now interested in restoring a consensus on nonproliferation as it was originally established in favor of more equitable and less oligarchic models as established in the TNP [Nonproliferation Treaty]. In fact, this will favor international cooperation for the peaceful use of nuclear energy. [end recording]

The Brazilian foreign minister expressed hopes that a draft agreement will be signed in 1988 to ban chemical weapons and destroy existing arsenals.

## Accord With PRC for Nuclear Reactor Construction Detailed

### Experimental Reactor

51002013a Rio de Janeiro O GLOBO in Portuguese  
15 Jan 88 p 6

[Text] Brasilia—Brazil and China may now develop a joint project for the construction of nuclear reactors using components supplied by the industries of the two countries. With the formal announcement made by President Sarney, the Accord of Peaceful Cooperation in the Area of Nuclear Energy became effective between the People's Republic of China and Brazil. The Accord favors exchanges in the technical fields and that of personnel training. It was signed in November by the ministers of foreign relations of both countries. The decree of promulgation, which contains a few more than 10 lines, indicates that the reactors will be mostly of an experimental nature. Like Brazil, China has a great interest in the construction of reactors fueled by low radioactivity thorium, which is obtained from monazitic sands. Unlike uranium, it is not considered a high-grade fuel and its price on the international market is extremely low. Preliminary studies by the Aerospace Technological center [CTA] indicate that it is an excellent alternative from the point of view of energy production, costing 50 percent less than uranium and producing 70 percent of the energy obtained with uranium in traditional reactors.

At present research on thorium is only being done in China, India and Brazil. The Accord gives priority to research on the construction of a reactor that uses this type of fuel, basically a fast breeder fueled by thorium excited by a small amount of enriched uranium. This fact is of extreme importance to these countries, who together have almost all the thorium reserves of the world.

Another important point of the Accord is the transfer of the technology already developed in China for the constructions of reactors fueled by unenriched uranium and cooled by heavy water. The Army Technological Center is working in this aspect with the support of the Nuclear Study Center of the University of Rio de Janeiro.

As far as Itamaraty is concerned, the Accord will not harm the image of the country in its diplomatic relations with countries of the West since its nature is totally peaceful. Brazil is not a signatory of the Treaty on the Nonproliferation of Nuclear Weapons of 1968, considered discriminatory against developing countries. However, it did sign the Treaty on the Ban on Nuclear Weapons in Latin America—the Tlatelolco Treaty—leaving its position on the subject clear.

## Physicists Only Fear the Accord May Have Military Purposes

Physicist Luiz Pinguelli Rosa, member of the National Council for Scientific and Technological Development of the Ministry of Sciences and Technology, considered the nuclear agreement between Brazil and the CPR to be very positive, but did not hide his concern that there may be cooperation between the two countries for military purposes.

"A scientific agreement with other countries is always beneficial, particularly with those of the Socialist Bloc, who were practically ignored by the military type governments. However, if items on the exchange of technology for military purposes were to be included, I would be radically against it," said Pinguelli.

According to him, there is much confusion in those agreements as to the use of nuclear energy. Pinguelli recalled that the Navy is developing projects on reactors through the Institute for Energy and Nuclear Research [IPEN], which it controls, for the purpose of building an atomic submarine.

"To make that project viable, Brazil needs enriched uranium and it does not have that technology. We know that the United States, the Soviet Union and other countries of Europe do not provide that technology for military use. Could it be that China would cooperate in that field?" asks the physicist.

Although he emphasizes his concern, Pinguelli hopes that Brazil and China will be able to develop joint projects and "establish a positive exchange of technology for peaceful purposes."

Luiz Pinguelli, who is also the director of COPPE (Coordination Board of Post-Graduate Programs in Engineering), has a special affection for China. "In 1984 I visited the Beijing Nuclear Physics Institute and was able to see very interesting projects close up. The following year we were visited by Chinese scientists. Because of all that I believe this agreement to be very attractive providing, as I said, that technology exchanges for military purposes are not included," declares the Brazilian scientist, who made it a point to stress the political aspect of the agreement. "A mutual cooperation pact with China breaks away from the bias against Socialist countries." Rogerio Cesar de Cerqueira Leite, a physicist from the State University of Campinas (UNICAMP) said: "Brazil would have much to gain from an agreement with China in the nuclear area." According to the scientist, China is very advanced in all leading technology and, specifically, in the nuclear area is already making its own reactors and for some time has been producing both atomic fission bombs and fusion bombs. He emphasizes, however, that this advantage refers exclusively to a nuclear agreement for peaceful uses, "since military uses would not be subject to inclusion in the agreement."

Nuclear physics Professor Marcelo Dami of the PUC [Pontifical Catholic University] of Sao Paulo, said: "The cooperation agreement is useful because it opens the possibilities of exchange of information between scientists of the two countries." In the opinion of the physicist, cooperation in the nuclear field "is a statement of understanding, good will and interest on both sides." The benefits that an agreement of that type may bring, according to Marcelo Dami, shall always depend on the good relationship between Brazilian and Chinese nuclear scientists.

"It is a known fact that China has a highly developed nuclear program, particularly with respect to the peaceful uses of the atom. That is why this collaboration could be useful to the country."

#### IAEA Oversight

51002013a Rio de Janeiro O GLOBO in Portuguese  
16 Jan 88 p 5

[Text] Brasilia—The International Atomic Energy Agency [IAEA] will oversee the strictly peaceful use of the technologies that make up part of the Brazil-China Nuclear Accord. This rule is contained in Article 6 of the document that establishes specific IAEA safeguards for all fissionable materials—enriched uranium or other form of atomic fuel or wastes—that make up part of the agreement.

The agreement also restricts the reexport of materials transferred from one of the signatories to a third country to reduce the risk that proliferation of nuclear technology would lead to its use for military purposes. Another important item is that of performing research for the establishment of safety standards for reactors.

Some projects are already being considered of a priority nature, benefitting primarily a small group of nuclear physicists consisting of civilians and military personnel who work in the Advanced Studies Institute of the CTA of the Air Force. Among the priority projects is research and development of fast breeder reactors, the most modern type of atomic reactor, which would be fueled by thorium.

The common interest of Brazilian and Chinese scientists in that project is the result of surveys that indicate that Brazil has the largest reserves of thorium on earth, enough for providing energy to the country for 10,000 years. This abundance creates the possibility of exporting the monazitic sand, from which thorium is obtained, to China. Up until 2 years ago, Brazil exported that type of sand to any country at laughable prices, but an agreement between the Ministries of Mines and Energy and Science and Technology led to the preparation of a decree-law that restricts the amount of monazitic sand exports to a minimum.

Created in 1979, the National Breeder Reactor Research and Development Program only went into the productive phase four years later, headed by physicists of the IEA [Atomic Energy Institute], who up to now have produced only theoretical studies for the construction of a 1-MW experimental reactor. However, the intention is to build reactors of up to five MW.

8908/12913

#### IAEA To Supervise Nuclear Accord With PRC

PY181735 Madrid EFE in Spanish  
1532 GMT 16 Jan 88

[Text] Brasilia, 16 Jan (EFE)—The IAEA will supervise the work of Brazilian and PRC experts in their joint effort to manufacture nuclear reactors fueled by thorium, which is less radioactive than uranium.

The condition is included in the agreement between the two countries signed by President Jose Sarney in Brasilia on 14 January.

Through the safeguard clause Brazil and the PRC agreed to IAEA supervision of the work on and security of nuclear reactors to be built by the two countries.

The Brazilian-PRC agreement also restricts the export to other countries of materials exchanged between the two countries, to reduce the risk of nuclear proliferation.

The PRC and Brazil have decided to grant priority to the research on nuclear reactors fueled by thorium because Brazil has the largest reserves of thorium in the world.

According to Brazilian authorities, the thorium deposits, which are extracted from monazite sand, are large enough to supply Brazil's electricity needs for the next 10,000 years.

The Brazilian Foreign Ministry today reiterated that the nuclear agreement with the PRC will only be used for the production of energy for peaceful purposes.

#### Sao Paulo, Rio Vie for Site of Plasma Laboratory

##### Indecision Delays Construction

51002013b Sao Paulo FOLHA DE SAO PAULO in Portuguese 12 Jan 88 p 18

[Text] The siting of the National Plasma Laboratory (LNP) depends now on a formal decision by the Ministry of Science and Technology, the signing of the legal documents and a decision on the location. However, a political dispute on the siting of the laboratory between the Secretariats of Science and Technology of Sao Paulo and that of Rio is delaying the decision by the Ministry on the location.



Minister Luiz Henrique da Silveira declared yesterday that as long as the secretaries of Sao Paulo and Rio de Janeiro do not arrive at a consensus as to which of the two states should be the site of the LNP, construction work will not begin. The Secretariat of Science and Technology of Sao Paulo, however, does not want to assume the responsibility for making the decision. Advisers to the secretary reported that "it is up to the federal government to make the decision," and that the Secretariat "is not exerting any type of pressure."

The study group for the National Plasma Program compared available areas, surveying the technical conditions of each one. The site initially indicated is in the region of Pedra de Guaratiba, a mangrove swamp 50 km west of Rio. This area was later discarded by technicians because of a high water table at several points, that would prevent underground cabling. Moreover, the site is subject to sea air, which in a short time could corrode the expensive and sophisticated laboratory equipment. Despite that, the Ministry of the Army is installing its Technological Center (CETEX) in the area.

Another area suggested is in the municipality of Xerem near Petropolis in the mountain region of Rio. According to technicians, this site has the suitable size and topography but does not have enough electric power. Up to now the most mentioned site for the installation of the LNP is at Cachoeira Paulista (195 km northeast of Sao Paulo), and belongs to the Space Research Institute. This 700,000-square meter area is near one of the largest electric power links of the country tied to the FURNAS [Brazilian Power Plants] system and to Itaipu. That is an important factor because of the high peak of power that would be required by the laboratory, a total of 250 megavolt/ampere at a time. If there were no strong circuit voltage nearby, violent oscillations in power caused by the LNP could damage the distribution network. The advantage of the site would be its location at an equal distance from Rio and Sao Paulo. Moreover, the land is near the Dutra Highway and has the necessary structure.

Silvio Salinas, 45, professor-chief of the Physics Institute of the University of Sao Paulo (USP), believes the laboratory should be in Sao Paulo so that the same group working with a Tokamak prototype (a pneumatic type machine that is used in confining plasma) in the USP since 1980 may establish the new center.

It is not only the site that is creating confusion. The budget of the new laboratory does not appear to be very clear either. Questioned by advisers, Minister Luiz Henrique said he does not know the cost of the project. About the possibility of obtaining loans, including from other countries, for the execution of the project, he said it is probable but a confirmation in this aspect "is still pending waiting on studies to be made."

Researcher Gerson Otto Ludwig, 41, chief of the Associated Plasma Laboratory of the Space Research Institute (INPE), which was selected as the basic nucleus for the creation of the LNP, told FOLHA, however, that the total cost will be \$62 million to be spent over a five year period. According to him, financing will probably come from Japan, who has shown an interest in lending the money. The Japanese expect that by doing this the supercomputers used in the laboratory will be purchased in their country. All together, \$15 million in equipment will be imported; the rest should be developed in Brazil in industries installed here.

When ready, the LNP will allow the country to perform research on the greatest energy alternative of the future: thermonuclear fusion, the main objective of the laboratory. Several countries already have controlled nuclear fusion, including underdeveloped countries such as China. However, the technological capabilities for the generation and use of that energy has not yet been developed; this should happen in the next 30 years, according to Ludwig. In addition to fusion experiments, the LNP will also carry out technological research with results in the short term that could have unusual industrial applications. The main programs in that area are the development of ionic propellants (for the movement of the first Brazilian satellite), radiation generators (various industrial applications), and the plasma centrifuge for the enrichment of isotopes.

According to Ludwig, the country now has 36 scientists specializing in plasma. However, it will need 75 for the establishment of the LNP. According to his estimates, \$5 million will have to be invested in the training of that personnel.

Salinas, however, believes Brazil has enough technicians and specialists and "the rest should become trained through the development of the laboratory."

#### Plasma Results from Superheated

Plasma is the state of matter in which the reactions of fusion occur with greater frequency; in this case, hydrogen isotopes. In the plasma state, gas remains ionized, that is, it loses electrons.

Uranium, which has a large number of protons, and hydrogen and its isotopes (heavier variations of the same element) of a smaller atomic number, are used in fusion.

The energy (nuclear) of uranium is generated by nuclear fission. Hydrogen isotopes may not be broken down since they have a single proton. The energy of the hydrogen nucleus is released when it fuses, creating the element helium. This physical-chemical reaction occurs in the sun and stars with great intensity.

Fusion presents a number of advantages by comparison with fission, says Ludwig. The fuels of fusion, deuterium and tritium (isotopes that are respectively two and three

times heavier than hydrogen—unlike uranium), are practically inexhaustible. The isotopes are extracted from seawater by centrifuges and electrolysis.

Another advantage of fusion is large amounts of power. According to Ludwig, a gram of hydrogen isotopes generates 94,000 kw/hours of power, enough to supply 1,000 homes for one month. A liter of water has the energy of 300 liters of petroleum.

In addition to those factors, the danger of [word presumably dropped] does not exist in nuclear fusion reactors. According to Ludwig, radioactive material would cool rapidly as it came in contact with the walls of the reactor. Another advantage is with respect to atomic waste. Waste products from a nuclear fission reaction remain reactive for hundreds of thousands of years, while fusion wastes lose their radioactivity in a little more than 10 years.

Despite advantages, science has not yet discovered a way to control and use nuclear fusion for the generation of power, something that will only happen in the next 30 years. One of the obstacles to this happening is the need to heat the gases (plasma at extremely high temperatures of over 100 million degrees Centigrade). The other problem is the confinement of this reaction since the most resistant materials existing melt at 1,000 degrees. Controlled nuclear fusion is only possible when confined by electromagnetic barriers.

#### **Sao Paulo Proposal**

51002013b Sao Paulo GAZETA MERCANTIL in Portuguese 14 Jan 88 p 10

[Article by Denise Neumann: "Sao Paul Wants The Laboratory"]

[Text] The Sao Paulo arguments for locating the National Plasma Laboratory there, the siting of which is being disputed with Rio de Janeiro after the document establishing the execution of that project was signed by Minister of Science and Technology Luiz Henrique da Silva, are that Sao Paulo has 70 percent of the plasma physics researchers of the country, 88 percent of the postgraduate students, 85 percent of the Brazilians with doctors and masters degrees and is also the site of four of five national laboratories. These figures were given to the press yesterday by Sao Paulo Secretary of Science and Technology Ralph Biasi.

#### **\$64 Million**

The National Plasma Program (PNP), which is being prepared by a task force created by the Ministry of Science and Technology (MCT) in April 1987, established the need for an investment of \$64 million during

a five year period. The laboratory is part of that program but, according to Biasi, the Ministry does not have resources allocated in its annual budget to finance its execution in 1988, which would postpone it until 1989.

Another possibility, that of foreign financing, is being negotiated within the framework of a loan the Brazilian Government wants to obtain from Japan. "That route is difficult," ponders the secretary, because the Japanese, according to him, "have no interest in having Brazil master nuclear fusion technology immediately."

The entire Brazilian nuclear program—also that of the world—is based on nuclear fission, whose principle is that of splitting the atom.

The technology of nuclear fusion is based precisely in the opposite process, that of joining two similar atoms, plasma being the necessary instrument for reaching the reaction, according to the secretary. It is an ionized gas—the fourth state of matter—and its confinement makes possible the generation of nuclear energy. According to Professor Sylvio Goulart Rosa Junior, director-president of the Sao Carlos High Technology Complex Foundation, through extremely high temperature (millions of degrees) it is possible to achieve the union of two hydrogen atoms (deuterium), which forms helium gas, whose weight is less than that of deuterium. From that difference in mass (weight) will come energy.

According to the professor, if Brazil were to invest quickly as of now in mastering that technology, which no country has mastered up to now, it would not have to live the situation in the future that it is facing today, "having to buy nuclear reactors from Westinghouse." The energy to be generated by that process, according to Rosa Junior, is the energy of the future, citing as an example its use in the generation of electric power.

#### **Cachoeira**

Biasi reported that the Sao Paulo proposal is that of siting the laboratory at Cachoeira Paulista, in an area of the Space Research Institute, and that the Sao Paulo Government would be willing to participate in seeking resources for that program. Today, the realization of that program would not require the signing of any agreement of technological cooperation with another country "since the entire world is at the research stage, we have access to that technology at zero cost through the simple exchange of information among scientists," says Rosa Junior.

BRAS:12013



## INTERNATIONAL

### Potential Israeli Nuclear Threat to Arab World Discussed

51004502 Cairo *AKHIR SA'AH* in Arabic  
23 Dec 87 pp 3-6

[Article by Muhammad Wajdi Qandil]

[Excerpts] If the peoples of the world are seeking security and safety, what have the Arabs done to realize their countries' national security and safety?

If Europe has found the minimum security umbrella after pulling the fangs of the nuclear missiles from its soil—in the wake of the American and Soviet giants' agreement—what have the Arab countries done to remove the nuclear weapons buried underground and threatening it with terrible destruction?

If the two superpowers—the United States and the Soviet Union—have arrived at the nuclear safety option, far away from a direct confrontation between intermediate-range missiles, and have laid the groundwork for an end to the nuclear arms race by destroying a whole generation of missiles, where is the nuclear security of the Middle East and the Mediterranean Sea, and where is the missing balance between the conventional weapons of the Arabs and the nuclear deterrent weapon in Israel's possessions?

What makes these questions more pressing—at this time in particular—is the fact that Europe has begun to emerge from the bonds of the nuclear threat while the Middle East and the Mediterranean Sea are about to step into the circle of nuclear terror with Israel's introduction of nuclear weapons to the area.

This is not to say that the Arab countries should plunge into a race of uncertain consequence to acquire a nuclear deterrent force to counter the Israeli threat or squander their capabilities in another bloodletting—besides those of the Gulf war and the sites of open conflict—to enter the competition for mass destruction.

The Arab countries may not be the first—and they may not be ahead in introducing nuclear weapons—but the region's safety and security make it incumbent upon the Arab leaders not to get swept away by the current plunging into the abyss so as to safeguard Arab national security and balance of power considerations in the area.

So far, and notwithstanding proof and evidence, the most recent of which is the confession of Israeli engineer Vanunu who worked for years in the Dimona reactor in the Negev Desert, Israel has not revealed anything or admitted to having nuclear weapons and is still opposing inspection of its nuclear facilities located 80 feet underground. It is maintaining its silence on allegations that it owns atomic bombs the size of the twin bombs dropped on Hiroshima and Nagasaki.

Israel is deliberately imposing a blackout on its nuclear activities to keep the Arabs and the world wavering between doubt and certainty.

This, decidedly, is its intention so that the terror of the nuclear deterrent weapon maintains its sway over Arab heads and so that delusion keeps fluctuating with reality and remains perched with its fearful image on the visible horizon.

The more Israel brandishes the weapon of nuclear deterrence—however indirectly—the more it maintains, if only dubiously, its superiority in the strategic balance with the Arab countries and the impact thereof on the capabilities and limitations of the Arab decisionmaking process.

The more the Israeli nuclear arsenal, buried in secrecy under the Negev desert, is shrouded with obscurity, the more the Arabs are inclined to be apprehensive and cautious, prompting a ruler like al-Qadhdhafi to plunge into the trap of obtaining nuclear weapons at any cost and by any means, unaware of the perils of such a step and its consequences on the security of the region and the safety of its people.

There are sure signs, however, pointing to Israel's possessing nuclear weapons and a good possibility that it has had an atomic bomb since 1967.

As far as Israel is concerned, the question is no longer whether it has the capability to manufacture nuclear weapons or whether it has actually done so, for information leaked from the Dimona reactor has transcended all that. The question now has become: will Israel admit to possessing this weapon or will it maintain its obscurantist position to keep the issue in the realm of doubt and conjecture?

Hence, Arab national security exigencies call on the Arabs to take the initiative in revealing the secrets of the Israeli nuclear arsenal hiding beneath the strata of the Negev desert so that it will not continue its growth behind a screen of deliberate silence. It is even possible to adopt an international position pressuring Israel to free the area of nuclear weapons, keeping it outside the sphere of destruction. This is a necessity along with the efforts being exerted to solve the Middle East problem and to establish peace in the region, for when a peaceful solution is reached, Israel will not need nuclear weapons to protect its existence and security.

It may be said that the nuclear force Israel has is considered relatively small compared to other nuclear powers in the world and therefore does not pose a strong threat to the Arabs.

The answer to this is that the mere presence of a nuclear weapon in Israel's hands, whatever its size, entails an obvious threat to Arab national security, according to the calculations of the Israeli decisionmaking process.

Moreover, influencing circumstances and factors cannot be controlled. Who insures against the folly and conceit of power in employing the weapon of nuclear deterrence?

Perhaps what happened in the 1973 October War is an indication of what might happen should the balance of power tilt against Israel. At that time, after the early days of the war, when the Bar Lev collapsed and the Israeli military command lost its balance under the impact of the first air strike and the crossing of the canal, Golda Meir brandished the nuclear weapon to defend "Israel's existence" and to secure a military support and supply airlift from American base depots in West Germany.

A story was making the rounds at the time about a Russian radioactive shipment crossing the Dardanelles on 22 October on its way to Egypt. American intelligence surmised that the shipment contained nuclear warheads to arm the Scud missile, which Egypt had previously received with conventional warheads to reassure the Arab states about allegations that Israel would deploy its nuclear weapons to stop an Egyptian attack on the Sinai front as well as a Syrian offensive in the Golan.

!!! Herein lies the danger: the existence of such a nuclear weapon in the hands of Israel may lead to two unthinkable possibilities:

1—A confrontation between the two superpowers in an area laden with conflicts and regional wars, a likelihood given the magnitude of American and Russian interests in the Middle East and the Gulf and in the shade of tumultuous tensions, the most dangerous of which is the Iraq-Iran war, and possibilities of a limited confrontation between the two superpowers as underscored by the 1973 events of 24-25 October which did not degenerate into a clash.

2—Arab endeavors to obtain nuclear weapons to effect a balance with Israel. According to reports, the Soviet Union has pledged to supply Syria with nuclear weapons should Israel employ its nuclear weapons in a confrontation with it. This may have been nothing but moral support on Moscow's part, but it does entail the dangers and possibilities of an unexpected nuclear confrontation in the region.

This calls for the removal of nuclear weapons from the region—whatever their size—to ward off any such possibilities at any time in the future, plus the tension and war from the Gulf, all the way to Lebanon and southern Sudan. To point out the gravity of such possibilities, suffice it to mention Israel's involvement in secret arms deals with Iran whereby Israel sold \$600 million worth of arms to the Khomeini regime. What is to prevent these weapons from being equipped with small nuclear warheads? And what is to prevent Israel from sending nuclear weapons to Iran?

What I mean to say is that Israel will stop at nothing to maintain its military superiority over the Arabs, and it is in its interest to strike at Iraq and cause its defeat in the war.

Perhaps the Israeli airstrike against the Iraqi nuclear reactor, aimed at thwarting ongoing nuclear research, is a good indication of Israeli intentions.

Furthermore, pivotal relations between Israel and Iran continue through the period between the rule of the Shah and the Khomeini regime. Their aim is to counter the growth of Arab power and lure it into the pitfall of attrition through side wars and siege.

Secret information indicates, however, that Israel has the capability to produce tactical atomic weapons, a more dangerous prospect given the area's small size and Israel's limited depth. Sophisticated research at the Dimona reactor revolves around this aim. These kinds of weapons have a range of 400 miles and carry nuclear warheads of limited size.

The first Israeli official statement alluding to Israel's nuclear activity, 1974, was put out by then Israeli president Arafat a few months after the October War. He said in what sounded like a pointed threat:

"Israel has always had in mind to develop a nuclear capability. Now, we have such a capability and, if need be, Israel can turn it into reality in a very short period of time!"

Accurate reports suggest that the Israeli nuclear arsenal is more sophisticated than previously thought and that it includes advanced-design bombs, some of which have a much greater destructive power than those used during World War II.

Another recently uncovered evidence indicates that Israel has deployed a short-range missile—400 miles—called Jericho-2, capable of carrying nuclear warheads. This is an advanced and more accurate version of Jericho-1, and is equipped with an internal guidance system.

It appears that the Israeli nuclear arsenal remained an enigma until a few years ago. Most of the information leaked about it was based on speculations and preliminary assessments. Hence, it is not known whether Israel has carried out any practical nuclear tests, even though some reports say it conducted an atomic test in collaboration with South Africa.

Even though the official Israeli position is that Israel will not be the first to introduce these weapons into the Middle East, such a pledge cannot be trusted because Israel is proceeding with its development of a nuclear arsenal, using the Dimona reactor, in addition to another nuclear warhead plant built at the same location in the second half of the sixties.

Perhaps the puzzling question is: From whom is Israel obtaining the enriched plutonium necessary for producing this number of bombs and nuclear warheads and does the Dimona reactor have the capacity to produce the required plutonium to manufacture one or two bombs a year?

There is no specific and definite answer. It is believed, however, that Israel has obtained about 100 kg of enriched uranium illegally—in what amounted to a theft operation—from a private American plant for the manufacture of uranium, the Nuclear Material and Equipment Company, in the city of Apollo, Pennsylvania. The blackout Israel tried to impose on the operation notwithstanding, this report has been substantiated. This amount of enriched uranium is enough to manufacture at least four atomic bombs. Another report alleged that Israel obtained large and undetermined amounts of plutonium from France during the sixties.

The most significant information contained in the report on Vanunu's testimony published by the SUNDAY TIMES may be that which confirmed the existence of a reactor for the manufacture of plutonium at the Dimona site. The existence of such a reactor has been suspected for a long time, but Israel never admitted to it.

Questions still persist, however, about Vanunu's testimony: Is it possible that the Dimona reactor has grown to six times its original size? And when did Israel begin producing plutonium at a rate of 40 kg a month? How many bombs and nuclear warheads has Israel actually manufactured, and how many fission bombs does it have?

There are other questions about Vanunu's credibility: What are his motives for divulging Israeli nuclear secrets? Was he actually able, as he claimed, to smuggle a small camera inside a sandwich to the reactor despite massive security measures at the plant? And why did he take this risk if he did not intend to have the film developed for many months until the Colombian journalist met him by chance in Sidney and tried to publish and promote his story in the European press?

One possibility is that Israeli intelligence made up and propagated the Vanunu story despite apparent signs that the Israeli government has suffered a security ordeal because of Vanunu's disclosure of nuclear secrets. But why?

Israeli military leaders have been very worried lately about the sophisticated Soviet SS-21 surface-to-surface missiles which Syria obtained recently, and about the possibility of their use against Israel.

Therefore, Israel may have wanted to kill any spirit of adventure Syria may have by brandishing its nuclear capability through the Vanunu disclosures. Or perhaps

the then Israeli prime minister, Shimon Peres, the mastermind of the Israeli nuclear build-up, wanted to proceed with peace negotiations in the Middle East and kill Yitzhaq Shamir's opposition by convincing the Israeli public that, because of its strength, military superiority and nuclear deterrent force, Israel is able to offer concessions without fear.

At any rate, these are likely possibilities in the political and intelligence game and in the battle of cunning and camouflage.

Prudence is essential in these cases so that the Arabs will not be fooled by that prospect and let their guard down, something that Israel would like them to do so that it may proceed with its nuclear build-up under the cover of secrecy and obscurity. At the same time, it does not admit to owning nuclear weapons so that it will not be accused of introducing them to the region even though all indications assert this fact.

I believe that a detailed account of the Israeli nuclear arsenal has its justification:

First, to find out what the other side has and what kind of influence and pressure cards it has at the negotiating table and in the field of confrontation.

Second, to compare Arab national security capabilities against Israel's nuclear armament.

To repeat the question posed by experts attending the international symposium on nuclear disarmament in the Middle East and the Mediterranean Sea, can a treaty be concluded between those who have and those who do not have nuclear weapons?

Where, then, does Arab national security stand on such a challenge? And how can the balance of power in the region not be upset by a nuclear weapon in the hands of one party and not the other?

As was said in the symposium: The Arab world can challenge the Israeli nuclear deterrence through an Arab non-nuclear deterrent force and without the pitfalls of a nuclear race. The important thing is to contain the nuclear power Israel has amassed and to mobilize an Arab and world lobby to free the area of nuclear weapons.

This may seem difficult and complicated, but given the region's circumstances and brawls from the Gulf to the eastern Mediterranean, this latent danger has to be averted.

It may be said that the nuclear threat in the Middle East is not posed by Israel alone—as the American point of view sees it—for other countries, such as Libya, are seeking to obtain nuclear weapons. There is also the possibility that Iran may possess a nuclear bomb, which



means that Iran may use a nuclear bomb in the war against Iraq. For that reason, the Khomeini regime is ready to pay the price to anyone.

This raises the question, from an Arab national security angle, about the possibilities of nuclear cooperation between Iran and Israel.

But this is another topic of a different dimension.

12502

#### **Seminar Calls for a Nuclear-Free Middle East**

45040054a London AL-TADAMUN in Arabic  
16 Jan 88 p 64

[Article by Amani Kamal: "At the Middle East Disarmament Seminar, Maj Gen Tal'at Musallim Reveals That in 1973, Carter Considered Dropping An Atomic Bomb on Egypt"]

[Text] While Ronald Reagan and Mikhail Gorbachev were signing the agreement to eliminate intermediate and short-range missiles from Europe, the Egyptian Peace Committee was holding an international seminar with the slogan "So That the Middle East and the Mediterranean Basin May Be Nuclear Weapons-Free Zones."

Experts from 11 Arab countries, 12 foreign countries, and several Arab organizations, as well as hundreds of Egyptian experts, researchers and political figures, participated in this seminar's activities, discussions and talks. Israel's possession of nuclear weapons was a topic of concern and apprehension of the first order, especially since every year the United Nations approves a draft resolution calling for the establishment of a nuclear weapons-free zone in the Middle East, without taking any practical steps to implement it. Moreover, there are signs and indications that Israel possesses nuclear weapons.

This brings up other questions. The most important one being: how can the Arabs confront the dangers posed by Israeli nuclear weapons?

Next, how can the call for nuclear disarmament in the Middle East be reconciled with Israel's continued existence as a nuclear threat and with the Arabs' corresponding desire to defend themselves?

A third question is: how can there be relations between Israel, which has never signed or ratified any international nuclear non-proliferation agreement, and a non-nuclear Arab country which has signed and ratified such agreements?

This last question was raised by Former Egyptian War Minister Amin Huwaydi, who answered it by refuting the statement that there must be nuclear proliferation in the area as a first step towards disarmament. He pointed

out that the Soviet Union is against nuclear proliferation but cannot step in to limit Israeli nuclear escalation. As for the United States, it has helped Israel become a nuclear country.

Amin Huwaydi is against the idea of a deterrent, i.e., that the Arabs turn to a superpower to provide nuclear security, because such guarantees are not reliable.

So, what is the solution?

Amin Huwaydi pointed out that it is possible for the Arabs to confront the Israeli nuclear threat through an unconventional deterrent such as incendiary, chemical or biological weapons, especially since the Arabs' first-strike capability is greater than the Israelis'.

The Palestinian expert Dr Nafi' al-Hasan suggested another solution—the Arabs' "demographic deterrent." This means that the size of the population of the Arab world, including the Arabs of Occupied Palestine, restricts Israel's free use of nuclear weapons. Even so, Dr Nafi' feels that establishing an Arab nuclear deterrent force is the only way to neutralize the Israeli nuclear threat.

#### **An Atom Bomb Over the Canal**

Until nuclear parity with Israel is achieved, or an unconventional deterrent is acquired, the question remains: when will Israel use its nuclear weapons?

Maj Gen Tal'at Musallim replied that Israel and the United States have agreed that if their joint domination of the region is threatened, i.e., if Israel is exposed to danger, nuclear weapons will be used. In 1985, Former President Jimmy Carter said that during the 1973 war he had considered dropping an atomic bomb on one of the cities along the Suez Canal.

Former Foreign Minister Muhammad Hafiz Isma'il said that Israel had pointed three nuclear warheads at Egypt during the 1973 war, and he declared that Israeli nuclear weapons threaten both the Arab World and the Soviet Union.

In this context, Journalist Muhammad Sayyid Ahmad spoke of the dangerous precedent which the nuclear arms issue poses for the Arab-Israeli conflict, and stressed the need to discuss this matter at an international peace conference. Egypt had raised the issue of Israel's possession of nuclear weapons at the Camp David talks, but the terms of the agreement did not address this issue. Furthermore, the peace treaty between Egypt and Israel did not prevent the latter from striking at the Iraqi reactor, or from developing its own nuclear capabilities. Moreover, Ahmad questioned whether Israel would allow Egypt to develop nuclear capabilities for peaceful uses of atomic energy.

### A World Without Nuclear Arms

In any case, the seminar's concern over the nuclear aspect of the struggle with Israel did not prevent it from showing concern for disarmament issues elsewhere in the world, particularly the Mediterranean basin, especially since the seminar coincided with the agreement to eliminate short- and intermediate range missiles from Europe, and with the general optimism over the possibility of nuclear disarmament.

Chairman of the World Peace Council Romesh Chandra feels that the signing of this agreement is, for all peace-loving people, a positive, important step towards a world free of nuclear arms.

Chairman of the Egyptian Peace Committee Khalid Muhyi-al-Din appealed to popular parties and committees around the world to step up their efforts to eliminate nuclear arms. He pointed out that ridding the Middle East and the Mediterranean of nuclear arms would also mean getting rid of the Israeli nuclear weapons which threaten the region, countries outside the region and Mediterranean countries alike.

The Soviet delegate to the seminar, Aleksandr Krazinov, concentrated on the significance of the missile agreement and on the Soviet Union's desire for disarmament. He praised the role which world public opinion has played in urging governments to limit nuclear arms. The speech by American Delegate Dr Thomas Macnawar reflected a more pessimistic viewpoint, holding that the United States, for several reasons, is not in a position to eliminate nuclear weapons from the Middle East. He also said that the nuclear arms reduction agreement between Washington and Moscow might expire within 3 months, and added that the United States is pessimistic about its chances of survival, since it is nothing but a declaration of intent. There can be nuclear weapons-free zones until tensions in the Middle East and the Gulf are reduced.

In its closing statement, the seminar decided to publish the papers and discussions delivered and conducted during the seminar, so as to unify everyone's efforts by creating a strong public opinion aware of the dangers of nuclear arms. It also decided to work together with Middle Eastern and Mediterranean organizations and peoples in order to create nuclear weapons-free zones.

8559

### INDIA

#### Gandhi Says Not Nuclear Armed

BK040342 Delhi Doordarshan Television Network in English 1600 GMT 3 Feb 88

[Text] The country's first nuclear-powered submarine, "INS Chakra," today joined the Indian Navy. With this, India became the second country in Asia after China to

have the nuclear-powered submarine. Besides China, the Soviet Union, the United States, France, and Britain possess nuclear-powered submarines. The "INS Chakra," however, will not be carrying any nuclear warhead.

The prime minister, Mr Rajiv Gandhi, inducted the submarine into Indian Navy at a simple ceremony at channel harbor at Visakhapatnam. A model of the new submarine was presented to the prime minister. Mr Gandhi addressed the gathering after the induction of "INS Chakra."

[Begin Gandhi recording] "INS Chakra" is propelled by nuclear power, but not armed with nuclear weapons. There will be regular reviews of safety measures and contingency plans for emergencies. We have given particular attention to the management of nuclear waste. There will be a periodical audit of waste material. India wants to live in peace with its neighbors and the rest of the world. We believe that durable peace is not possible without peaceful coexistence. We believe that assured survival is not possible without the elimination of nuclear weapons. [end recording]

The defense minister, Mr K.C. Pant, and the naval chief, Admiral Nadkarni, were present on the occasion. Earlier, the prime minister went inside the submarine and met the crew members. He spent more than an hour in the submarine.

#### Soviet Union Leases Nuclear Submarine to Navy

6X051606 Delhi Domestic Service in English  
1530 GMT 5 Jan 88

[Text] The Soviet Union has leased a nuclear submarine to India for use by the Indian Navy for training purposes. It has no nuclear weapons or simulations on board. The vessel will depart for India in the next few days.

#### Soviets To Lease Nuclear Submarines to India

BK171025 Islamabad Domestic Service in English  
1600 GMT 16 Jan 88

[Ghani Erabi commentary]

[Text] India's acquisition of four [as heard] nuclear submarines from the Soviet Union shatters the dream of the Indian Ocean remaining a nuclear-free zone and proclaims India's ambition to push beyond national defense to foreign adventurism. Nuclear submarines are designed to venture far out from home bases stealthily and for long stretches of time. The (?age) of nuclear power eliminates the necessity of submarines' surfacing to recharge their batteries or touching home bases to refuel, and the quieter engine prevents detection, enabling the submarine to coil around stealthily and pounce on unwary victims.



The nuclear reactor is not open to international inspection and whether the Soviet submarines leased out to India are actually equipped with any nuclear warhead is not known. But they definitely are designed to carry nuclear warheads. The India-Soviet deal will accelerate the nuclearization of the Indian Ocean, ringed round by the world's largest concentration of human population. This is sadly regrettable, coming as it does in two countries protesting the loudest about keeping South Asia and the Indian Ocean nuclear-free.

India, which has been objecting so vigorously even to an occasional passing through of the American fleet for fear of nuclear contamination, now plans to station four to six nuclear submarines permanently smack in the middle of the Indian Ocean. And the Soviet Union, which has been threatening Pakistan with dire consequences even for seeking nuclear capability, is itself violating the sanctity of South Asia by enhancing the nuclear capability of India. It is such moral flexibilities that destroy moral potentials.

Islamabad so far has assiduously avoided making any comments on India's massive arms build-up on grounds that every country is the best judge of its own defense requirements. But the acquisition of nuclear submarines is a different ball game. The purpose here is not self-defense but to project the country's power and influence well beyond its frontiers. The Pakistan Foreign Office spokesman has rightly underlined the wreckless expansion of India's military power, totally disproportionate to its legitimate defense needs, which cannot but intensify perception of insecurity in the neighborhood. He has also pinpointed the Soviet Union's role in topping the supply of offensive weapons systems to India over the years with lease of nuclear submarines now. This unbalanced policy, the spokesman has emphasized, aids and assists in heightening the threat to other countries in South Asia and betrays an extraordinary disregard for the imperatives of peace and security in this region.

A U.S. Government spokesman has said the USA is opposed to any transfer of nuclear reactors without international safeguards and has asked India for clarification. The Soviet-leased nuclear submarines to India should be an eye-opener to those U.S. elements who are obstructing the lease to Pakistan of unarmed AWACS aircraft that can warn Pakistan of the approach of sneak enemy raiders across the long frontier on the northwest and from the sea to its south.

**Soviet Nuclear Submarine on Loan for Training**  
OW210315 Tokyo KYODO in English  
0150 GMT 21 Jan 88

[Text] Tokyo, Jan. 21 KYODO—A Soviet nuclear-powered submarine believed to have been loaned to India has sailed down the Sea of Japan from Vladivostok in the Soviet Far East for India. Western military sources in Tokyo said Thursday.

The Soviet Union said early this month that a Soviet nuclear-powered submarine would be loaned to India for training purposes. The Soviets said it would carry no nuclear weapons.

The submarine is believed to be the first nuclear-powered vessel to be provided by the Soviet Union to another country. The Soviet Union also provided MIG-29 fighters to India last year.

The sources believe the vessel loaned to India is a "Charlie I" class cruise missile submarine with a displacement of about 5,000 tons, an "outdated" model built between 1967 and 1972.

With the loaned submarine, India has become the second country in Asia, following China, to possess a nuclear-powered submarine.

The sources also believe India wanted the Soviet nuclear-powered submarine to use as a basis for building a similar vessel.

**Nuclear-Powered Submarine Joins Navy 3 Feb**  
BK031254 Delhi Domestic Service in English  
1230 GMT 3 Feb 88

[Text] India's first nuclear submarine "INS [Indian naval ship] Chakra" joined the naval fleet today. It was inducted in the presence of the prime minister, Mr Rajiv Gandhi, at Visakhapatnam. The Indian Navy is the second in Asia to have a nuclear-powered submarine after China. "INS Chakra" is on lease to the Indian Navy from the Soviet Union. Mr Rajiv Gandhi said this Soviet gesture marks a milestone in Indo-Soviet cooperation in defense.

**WEEKEND Cites Indian Gunboat Diplomacy**  
BK070620 Colombo WEEKEND in English  
24 Jan 88 p 7

[Rex de Silva article: "Nuclear 'Fallout' From India's Regional Quest"]

[Text] When it celebrates its Republic Day on Tuesday [26 January], India would have also entered the big league of regional superpowers.

By then its newly acquired Charlie I or Victor Class nuclear powered submarine would have sailed into the warm waters of the Indian Ocean from the cold of Russia's Vladivostok.

Though reputedly obsolete in superpower standards, the nuke-sub leased out by Moscow undeniably makes India the only Asian country besides China to have such military hardware.

With its arrival in India, the subcontinent invariably becomes a hardcore arena of nuclear arms race.

New Delhi has had visions of a great naval superiority in its own endeavours to reach the status of an Indian Ocean power.

It had always envisaged the control of the waters of this great ocean. For it is said by military strategists of yore that "whoever controls the Indian Ocean can dominate Asia, and in the next century the future of the world will be decided in these waters."

India's great hunt for a mighty navy began in the early seventies when the American fleet led by the "Enterprise" cruised into the Bay of Bengal during the Indo-Pakistan confrontation during the liberation of Bangladesh.

Ironically it is the United States that was first to raise guarded objections about India's new acquisition. Its quarrel was not with Delhi. But with its own archrival the Soviet Union.

On Friday last the U.S. State Department spokesman Charles Redman expressed certain misgivings saying that the leasing of the submarine by Moscow clearly introduces a new weapons technology into South Asia. He further clarified his government's policy saying that the U.S. always opposed transfer of nuclear reactors which also include nuclear propulsions to countries which are not members of the Nuclear Non-proliferation Treaty. It is reported that Washington followed up the issue with Moscow at a bilateral meeting in the U.S. capital early this week.

One can nevertheless surmise that the U.S. would hardly pursue a strong line on this issue for many reasons. Washington obviously is making friendly overtures to India, which it has come to recognise as a regional power having certain unwritten rights in displaying its dominance over the rest of the neighbouring countries. At a time when relations with the Soviet Union are at a friendly peak, one cannot expect serious polemics—for that matter over an old sub.

What seems rather strange is the continued and enhanced American military assistance to Pakistan. It remains an absolute thorn in Indo-U.S. relations. One particular reason that prevents American dissent over the Soviet lease to India is their own high level weapon induction to Pakistan.

Coinciding strangely with the lease of the submarine by India was an announcement by President Ronald Reagan that he was willing to sanction a 480 million dollar military package to Islamabad; a part of a massive 4.2 billion dollar deal which will include among other sophisticated military material the controversial AWACS.

Reagan's decision was quite surprising too as there were two statutory blocks from the Congress, viz. the Symington and Solarz amendments. These reportedly call for

the suspension of assistance by U.S. to any country acquiring nuclear weaponry or smuggled nuclear material from America for weapon manufacture.

Reagan apparently decided to use his waiver against both these amendments insisting that Pakistan does not possess a nuclear explosive device.

According to independent intelligence reports including those in USA already made public, Reagan could perhaps be wrong. Disclosures about facilities in Kahuta plant have hardly been disputed. The recent conviction of a Pakistani national named Arshad Parvez in Philadelphia for attempting to export special material to build a uranium plant also bears testimony to secret Pakistani "bomb" plan.

Arguably Reagan was convinced that Pakistan would try to stay away from the nuclear option.

India for very obvious reasons has tried to expose Pakistani actions on the nuclear field. Perhaps the main intention was to cover up its own nuclear proliferations.

Compounding the crisis for Islamabad is the latest scandal in Bonn where the authorities have stumbled on an operation where radioactive material capable of making weapons [was] being sent to Pakistan and Libya.

Two days ago however the West German Government said there was no proof to justify the charges.

India evidently suspects Pakistan of gaining nuclear capability in order to challenge its own position as a regional power. On the other hand Pakistan is becoming increasingly xenophobic of India which it argues is improving its nuclear prowess thus threatening its own security. Both these theories are correct in their very essence. But that hardly helps the rest of the countries in South Asia to remain free of an impending nuclear threat.

The U.S. and the Soviet Union seem to overlook the awesome subcontinental nuclear realities. They are evidently preoccupied with their own normalisations process to improve their respective image vis a vis the rest of the world.

Yet, a reversal of the awesome crisis facing South Asia could be achieved only through superpower intervention. Initially if they stop providing the know-how to the protagonists in the Indian subcontinent. [sentence as published]

For instance, the induction of brand new weapons to Pakistan from U.S. and [as published] only prompted India in matching it with a new Soviet built arsenal.

In mid-December, New Delhi received its first shipment of the latest Soviet MiG 29 supplied by Moscow at comparatively less cost than what India pays for the

French Mirages. The latest input into the Air Force has improved India's superiority in the sky, thus helping its plans for regional supremacy.

Likewise, the Indian Army is being refurbished to meet new regional challenges. The recent skirmishes with Pakistan in the Himalayan glaciers of Siachen ended with decisive success to New Delhi.

It is in fact a paradox that the very same 14th Sikh Light Infantry that fought in the snow mountains almost faced its Waterloo behind the cadjan curtain of Jaffna.

Though it may sound incredible, certain developments in Sri Lanka have had a tremendous impact on India's regional-power politicking.

Admittedly, it is India's growing fears of U.S. presence in the Indian Ocean that somehow aggravated Sri Lanka's ethnic conflict and incidence of terrorism.

The significance of Trincomalee harbour is now being highlighted in the Indian media as the "hot potato" of the Indo-Sri Lanka dilemma incorporating the ethnic fiasco.

We have during the past half a decade underscored its significance and also suggested how to avoid the agonising diplomatic calamities that we did encounter in the process.

This newspaper forewarned about the fiasco that would follow the leasing of the Trinco tank farm.

As we predicted India reacted with xenophobia of the so-called "third country factor" and as we can see even today from the disclosures in THE HINDU the bogey of CIA has once again been sounded. This happens to be the basis of the letters of exchange too, which now needs reciprocity through a treaty.

It is also reported that India was influenced in signing the accord because it feared a U.S.-Sri Lankan deal in Trincomalee would endanger its own security. These fears arose mainly due to unnecessary pronouncements by various politicians about giving Trincomalee to U.S. for a quid pro quo to keep Indians out while beating the daylight out of Tamil guerrillas.

New Delhi for some odd reason took these seriously and made its own plans for Sri Lanka. The underlining factor was its own ulterior motive of maintaining the regional superiority without any impediments or inconveniences.

The net result as we experience has only put Sri Lanka in a terrible mess, where its integrity and sovereignty could be under constant threat.

On the other hand India is sitting pretty as the overlord of South Asia with Washington and Moscow giving it a veritable "carte blanche" to settle regional problems in

its own inimitable way. And we got the IPKF [Indian Peacekeeping Force] while she sails her Charlie I stepping up the gunboat diplomacy in the Indian Ocean.

#### **Concern Over Nuclear Materials Shipments to Pakistan**

51500097 Madras THE HINDU in English  
17 Jan 88 p 1

[Text] Official sources here have reacted sharply to the disclosure of the reported illegal shipment of fissionable material to Pakistan by a West German firm and the almost simultaneous announcement of a waiver granted to the Symington and Solarz amendments by the U.S. President, Mr Ronald Reagan, which meant the resumption of U.S. military aid to Pakistan.

The sources said that the U.S. action clearly showed how eager it was to turn "a blind eye" to Pakistan's nuclear weapons programme which has over the past 11 years been built up through theft, stealth and deceit. Not only was Pakistan stealing 'parts' for its weapons programme as the Arshad Pervez case revealed but it was now smuggling in fissile material, according to the recent West German disclosures. It has been proved earlier that Pakistan has succeeded in illegally procuring from the U.S. krytron switches used in nuclear devices in the Nasir Ahmed Vaid case in 1984-85.

When Pakistan saw the U.S. looking the other way it was emboldened to break the laws of other NATO countries, like the present violation of West German laws. In fact, exonerating Pakistan of violating nuclear proliferation laws, the U.S. was tacitly encouraging Pakistan to go ahead with its nuclear weapons programme, sources said.

'Diverting attention': About the Pakistani Foreign Secretary, Mr Abdus Sattar's objections to India's leasing a nuclear submarine from the Soviet Union, the sources said it was an obvious attempt to divert attention from reports of a Pakistani breaking U.S. laws to send a special form of steel for nuclear purposes to Pakistan. The State Department has admitted that Pakistan had been involved in the Arshad Pervez attempt to smuggle nuclear weapons material out of the U.S. About the nuclear subs, India has stated categorically that the leased submarine did not have nuclear weapons.

07310

#### **Ships Armed With Nuclear Weapons Call at Indian Ports**

51500096 Calcutta THE TELEGRAPH in English  
18 Jan 88 p 4

[Article by S. Srinivasan]

[Text] New Delhi, January 17—Thirty warships from 19 countries, some of them carrying nuclear weapons, visited Indian ports in 1987, signalling a shift in the long-standing policy on foreign warships.



Foreign missions have been told that India is opposed to the presence of nuclear weapons in the Indian Ocean and such ships should not make port calls. Despite this many nuclear weapons carrying ships have touched Indian ports.

According to rough estimates, ships from the US, and UK, France, Belgium, West Germany, the Soviet Union and Asian neighbours like Indonesia and Malaysia have made port calls on Bombay and Cochin. The visits have increased since the outbreak of the Gulf war.

#### 'No Change in Policy'

Though official sources deny that there has been a change in policy, there is no way in which the visit to nuclear weapon carrying ships can be prevented. Mrs Indira Gandhi had formulated a policy of not allowing nuclear ships, but after her death no questions have been asked about the weapons on the visiting ships.

It is generally assumed that such ships, knowing India's sensitivity to nuclear weapons, will avoid coming here. The minister of state for defence, Mr Shivraj Patil, had said in Parliament that the government "trusts" that requests for host facilities would not be solicited for nuclear warships.

#### French N-ship

On January 3, a French warship, *Clemenceau*, called on Bombay for "rest and recreation." According to defence journals, *Clemenceau*, an aircraft-carrier, is "nuclear capable" and carries nuclear warheads.

The carrier's assault-and-interceptor fighter planes are fitted with tactical nuclear bombs and air-to-air Magic Matra 530 and air-to-sea Exocet AM-39 missiles. There are 20 such fighters on the carrier.

Several frigates and destroyers of the US Navy have also been visiting Indian ports. Between 1971 and 1983, no American warship was allowed to visit Indian ports, but the situation changed in 1984. In 1984, two US Navy ships [as published] visited Bombay, in 1985 one, in 1986 two and in 1987 seven. None of them touched Madras.

#### Submarines

Besides warships, submarines from various countries have also been moving in Indian Ocean waters. The government says that visits of foreign warships to Indian ports are inevitable because Indian Navy ships too call on foreign ports. The *INS Godavari* stopped over the US ports and *INS Ganga* visited Japan recently. Annual cruises of Indian Navy vessels are organised to southeast Asia, Gulf and pacific regions.

The largest issue in question is India's stand on declaring the Indian Ocean as a zone of peace.

#### Doubts Over Soviet Reactors Said To Persist

515000999 Bombay THE TIMES OF INDIA in English  
12 Jan 88 p 1

[Article by S. Kumar]

[Text] The talks between the Soviet Union and India on the purchase of Soviet nuclear reactors are still in progress and an agreement is not yet in sight.

Contrary to repeated Soviet claims that India would buy its power reactors, doubts over the basic safety aspects of the Soviet reactors persist and the Indian atomic energy officials have posed more questions to the Soviet team on this issue during a meeting here last week.

According to sources, the Soviet team gave some technical information sought earlier. India has asked for more information on safety philosophy and shutdown systems. Only now the Soviet team has understood the safety requirements demanded by India.

Meanwhile, the Atomic Energy Regulatory Board of the government of India has been asked to give its opinion on the safety aspects of the Soviet reactors. The AERB report is expected in the next few weeks. The report may ask more questions, it is pointed out.

In all the discussions so far, the conditions advanced by India remained unchanged. For example, it has been pointed out to the Soviet team that the deal will not go through until safety related aspects are cleared to the satisfaction of the Indian side. Similarly, India will not accept any full scope safeguards which entails international inspection of all Indian nuclear establishments.

At best, India will agree for bilateral inspection of the site where Soviet nuclear materials are used. To limit even the bilateral inspection, India has made a suggestion that the spent fuel from the Soviet supplied nuclear reactors will be shipped back to the USSR. If the spent fuel is stored and processed in India, it will invite further inspection of these facilities by the Soviet Union.

Also, the required enriched uranium for the Soviet reactors should be met entirely by the Soviet Union. India will not divert its natural uranium resources in any way towards meeting the requirements of the Soviet reactors. This is to avoid a possible request that India can send its natural uranium to the Soviet Union for getting enriched uranium.

The decision to import Soviet reactors should not impinge on the existing indigenous nuclear power projects.

The cost of the Soviet reactors is still a mystery. So far the Soviet delegations have not given any indication in this regard. They have, however, offered soft loans at 2.5 percent interest. The Soviet teams had been insisting on signing an agreement before discussing the finer details of the contract.

The Soviets have not realised that signing an agreement is not an easy task in India. First, the department of atomic energy should make a case for buying the Soviet reactors. The AERB should give the technical clearance.

Then, the Atomic Energy Commission should approve the proposal and forward it to the Prime Minister and subsequently cabinet approval should be obtained. Then, comes the question of signing an agreement with the Soviet Union.

The department of atomic energy has reacted differently to the Soviet offer on different occasions. When Mr H. N. Sethna was the chairman of the AEC, he rejected the offer point blank. His successor, Dr Raja Ramanna, initially showed enthusiasm but later turned totally hostile to the idea. The present chairman, Dr M. R. Srinivasan, is said to be having "an open mind." His official reaction is that the matter is "under consideration."

The Soviet team which came here last week included Mr B. A. Semenov, deputy chairman of the USSR state committee for utilisation of atomic energy as the head of the delegation. Others were: Mr V. D. Gulko, president of the commercial organisation, Atomenergosexport, Mr Y. K. Voshezensky, head of the USSR state planning committee, Mr E. A. Akopian, president, Soyuz Atomenergoproekt, and Mr V. A. Skotvitsin, chief expert, USSR state committee for foreign economic relations.

This group was accompanied by a team of experts namely, Mr A. S. Gavinkov, vice-president, Atomenergosexport, Mr V. P. Tatarnikov, chief engineer, Atomenergoproekt, Mr Kulichenko, expert, USSR committee for utilisation of atomic energy and Mr O. I. Melkin, expert, Atomenergosexport.

While the Indo-Soviet talks are in a nebulous state, a two-member team comprising Mr V. P. Mordukhai, deputy chairman, USSR committee for foreign economic relations and deputy minister for atomic energy, Mr A. L. Lapshin, arrived in Delhi today, ostensibly "to finalise the draft inter-government agreement on nuclear power stations", after meeting officials of the external affairs and finance ministries.

The unilateral statements by the Soviet dignitaries on the purchase of Soviet nuclear reactors have embarrassed the Indian atomic energy officials more than once. The latest one to add to the confusion is the reported statement about a Soviet nuclear power reactor for West Bengal.

Sources in the DAE said the Soviet official might have referred to the Soviet offer of a thermal power station to a private industrialist. Either the Soviet official mistook this for a nuclear power station or that the reports misinterpreted the information.

07310

#### **Report on Inaugural Function of Indian Nuclear Society**

51500095 Bombay: THE TIMES OF INDIA in English  
21 Jan 88 p 5

[Text] One of the dilemmas concerning the Indian nuclear industry today is whether or not it should "indulge in the world-wide trade" of components and technology. Dr P. K. Iyengar, BARC director and member of the Atomic Energy Commission (AEC), said here yesterday.

Speaking at the inaugural function of the Indian Nuclear Society, Dr Iyengar said the society would have to debate whether the country should resort to imports, like in the field of electronics, thereby incurring a foreign exchange drain.

However, he added that the formation of the society was a tribute to the indigenous capability, which had been perfected in a short span of 40 years since the inception of the AEC.

Mr J. R. D. Tata, who was described by the AEC chairman, Dr M. R. Srinivasan, as the "senior most nuclear technologist of the country," formally inaugurated the society. Mr Tata has been an AEC member since its inception in 1948.

In his address, Mr Tata noted that the only other subject which had raised as much "heat and controversy" as that generated by nuclear power, was religion and fundamentalism. It was "remarkable" that even among educated people the "irrational" belief that nuclear energy was linked to disaster continues, he felt.

Mr Tata announced that he proposed to set up an Institute of Advanced Learning, of which the former AEC Chairman, Dr Raja Ramanna, will be the director. He said the Institute would include faculties in humanities, philosophy and music.

Dr Srinivasan said the society sought to institutionalise the interaction that has existed between the nuclear establishment, academic institutions and industry. It provided a forum for members to enter into "open dialogues" without governmental and institutional restraints, the AEC chairman noted.

Dr M. V. Ramaniah, chairman of the society's steering committee, said the activities of the society would include organising national and international symposia.



the starting of a Indian Journal of Nuclear Science and Technology, and providing training facilities for the expanding nuclear industry.

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**Position of Heavy Water Reactor Program Given**  
S1500100 Madras *THE HINDU* in English  
11 Jan 88 p 7

[Text] Pune, January 10—Dr M.R. Srinivasan, Chairman of the Atomic Energy Commission, clarified here on Saturday that the pressurised heavy water reactor (PHWR) based nuclear power programme would not be given up. The import of light water reactors (LWR) was being considered solely in the context of bridging the gap between the energy demand forecast by planners and the capacity considered feasible using coal, hydel and nuclear sources as per current plans.

He stated this at the Indian Science Congress where he delivered the platinum jubilee lecture of the engineering sciences section on "The challenge of reactor technology".

Automatic shutdown: Talking specifically about the Narora Atomic Power Project (NAPP), Dr Srinivasan said that because of its location in the seismic zone, the design criteria had to ensure that the station would continue to operate safely even during tremors with the horizontal ground acceleration up to one-sixth to one-seventh the acceleration due to gravity. The power station, he pointed out, would shut down automatically if the ground acceleration became 0.30 g.

Extensive analytical work had been carried out to evolve the appropriate design for various structures. Snubbers and other devices had been used for restraining movement of a number of components, thereby ensuring the integrity of piping systems as well as alignment of various components. While the reactor building dome at the Madras Atomic Power Station (MAPS) was a single barrier, for Narora a full double containment design had been adopted, Dr Srinivasan said. This design, limited the overall leak rate too much lower than the MAPS value which is 0.40 percent of contained volume a day.

Of the eight proposed new reactors, the NAPP reactors are expected to be ready by 1988-89 and those at Kakrapar by 1990-91. The others would become operational by the mid-Nineties.

Advantages of corpn.[as published]: To facilitate the completion of the projected energy generation of 10,000 MWe by 2,000 A.D., Dr Srinivasan said the Nuclear Power Board had been converted into a corporation, the Nuclear Power Corporation of India, Ltd. This would enable it to have operational flexibility, mobilise public resources and at the same time ensure accountability on time and cost overruns.

He also reacted sharply to two other news reports that have appeared in the local dailies. One alleged that the Soviets had agreed to set up one of the LWRs they were giving to India in West Bengal. "I do not believe it," Dr Srinivasan said and added that no decisions had been taken so far on the Soviet reactors.

The other report had said Dr Srinivasan was a non-believer in solar energy and had rejected outright its potential as an energy source. The news item had alluded to his writing in a journal *Science and Society* some years ago. Refuting this, Dr Srinivasan said it was not appropriate to pose the question of nuclear versus alternative sources of power generation as each had its own role to play in meeting the country's energy needs.

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**Scientist Claims Uranium Discovered in Orissa**  
S1500094 Calcutta *THE STATESMAN* in English  
22 Jan 88 p 14

[Text] A geology scientist of Jadavpur University claims to have discovered substantial uranium and titanium dioxide deposits along a 250 km stretch of coastline between Puri and Balasore in Orissa. The teacher-scientist, Mr J. N. Bhadra Choudhury, said in Calcutta on Thursday that he had recently presented a paper on his findings at the Indian Science Congress held at Pune earlier this year. He also submitted a report on the subject to the Council for Scientific and Industrial Research, which had sponsored his project.

Black sands and monazites the ores in which uranium deposits are usually found have been reported from the coastline near Vishakhapatnam in the past. Some garnet and ilmenite have also been found earlier in the Thinevelley, Ram Nad and Tanjore areas on the eastern coast. Till now, according to Mr Bhadra Choudhury, there was no record about the occurrence of monazite and ilmenite near Puri. Mr Bhadra Choudhury has shown that there is a high rare earth element content in the uranium located in the monazite near Puri. The titanium dioxide in the ilmenite is capable of being naturally enriched.

While the use of uranium is universally known, titanium dioxide is necessary for the construction of rockets and for making high-grade steel necessary for several kinds of sophisticated equipments. Mr Bhadra Choudhury's interest was first aroused during his trip to Puri in February last year. In March he returned to the spot to collect samples and had his findings confirmed at the laboratories of Berlin and Göttingen universities when he went to West Germany to present a paper in September last year.

Mr Bhadra Choudhury claims that the Puri monazite has the highest uranium content when compared to monazites found near the coastlines in other parts of the world. While the Kerala monazite has a uranium content

of 0.34%, the uranium content in Puri is 1.49%. In Brazil, uranium content of coastal monazite is 0.15%, in Egypt 0.44% and New South Wales 0.22%.

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#### **AEC Chairman Reports on Department's Activities**

51500048 Madras *THE HINDU* in English  
13 Jan 88 p 7

[Text] Pune, January 12—"The Department of Atomic Energy might have to shed some of the non-nuclear areas...to other institutions," Dr M.R. Srinivasan, Chairman, Atomic Energy Commission (AEC) has said. He was presenting a report on the department's activities in the special plenary session for science bureaucrats at the Science Congress here on Monday. We have all along been following a departmental stores approach. Now we have to look at the relevance of all our activities to the power programme," Dr Srinivasan said. According to him, 80 percent of the budget for atomic energy goes to nuclear power generation, 15 percent to R and D, and the rest to allied programmes.

The 100 MW Dhruva reactor at the BARC, Bombay, is now operating close to its installed capacity. Dr Srinivasan said the condition of the internal vessel of the Tarapur plant was recently assessed and was found to be problem-free. There was no need to think in terms of decommissioning the plant at this stage. It could operate for 25 to 30 years.

Similarly, one of the reactors of the Rajasthan Atomic Power Plant (RAPP) which had developed some snags, was now performing satisfactorily, Dr Srinivasan said. However, a decision had to be taken on scaling up its generation, to the full level.

The NAPP-1 (Narora Atomic Power Project) he said, was expected to go into operation some time this year, while NAPP-2 would be ready next year. Both the NAPP and Kakrapar power plants are designed with double wall enclosure—a pre-stressed concrete interior and a reinforced concrete exterior.

A-thermal reactors: Work on designing a 500 MWe thermal reactor was progressing satisfactorily and by 1997, the design for six such reactors would be completed, Dr Srinivasan said. Designs of four 235 MWe thermal reactors will also be ready by then.

With a near 90 percent indigenous component in the implementation of the Madras Atomic Power Project engineering and manufacturing of components by the Indian industry had stabilised. Considerable degree of automation has also been introduced in the reactor technology of the Department. All this would help define the time-cycle more precisely, he said. Reactor construction time would come down from 10 years to about seven or eight years.

Speaking about the technologies generated by the nuclear energy programme, Dr Srinivasan said the on-line remote fuel loading technology developed by the BARC was as complicated as designing a jet engine. Several kilometers of normal superconducting wire of niobium-tin alloy had already been made by the Nuclear Fuel Complex, Hyderabad, and so had magnets with niobium-tin wires.

**Radiation-killing:** The Atomic Energy Regulatory Board (AERB) has cleared radiation killing of microbes in seafood, Dr Srinivasan said. Similarly, treating spices by radiation has also been approved. Though no irradiated food product is as yet commercially available, such spices and marine food will probably enter the market soon.

The food industry, he said, had taken up this technology with interest. Irradiation of potatoes and onions had been demonstrated to be safe, but was yet to be cleared. There was 40 percent wastage in onions and potatoes during long hauls and long storage. If irradiated, it would come down to about five percent.

The DAE is exploring exploitation of plant mutants with radiation. Some species of plants have shown promise, Dr Srinivasan said. The AEC has also decided to institute a Radiation and Isotope Technology Board as a semi-commercial enterprise to make radioisotopes more easily available to users.

Similarly, a recent proposal to set up a Centre of Excellence in Mathematics in Delhi is being seriously considered. The idea, he said, was to spawn many more centres of mathematics outside the DAE. But not many qualified people are available for heading such institutions.

The botany award goes to Mrs Vandana Tiwari of Jiwaji University, Gwalior, for her work on 'Feeding trials with food infested with aspergillus niger in bioassay experiments on albino rats.'

Mr A. Ajay Ghosh gets the chemistry award for his work on 'solid-phase synthesis of N-alkyl peptide amides.' Mr Ajay Ghosh is from the University of Calicut.

Work on 'Brain chromatin during development' fetches Dr B.R. Das of the Vikram University, Ujjain, the award in zoology.

The winner of the award in agricultural sciences is Mr A. Savasankar of the Andhra Pradesh Agricultural University, Nandyal, for his work on 'physiology of growth, development and grain yield in foxtail millet.'

A tutor at the Department of Medical Genetics of the Madras Medical College and Government General Hospital, Dr G. Kumaramanickavel has been given the award in the area of medical sciences for his work on 'male fertility.'

In the area of humanities and social sciences, Mr Deb Dulal Datta Roy has been awarded the young scientist award for his work on 'organisational health and its effect on quality of working life.'

The ISCA young scientist award carries a merit certificate and a cash award of Rs 500. A further Rs 2,500 is paid to each recipient towards supporting the research work that the person proposes to do.

The ISCA introduced the young scientist award programme in 1981. It enables young scientists to present their proposed research work during the annual session of the Science Congress. For excellent presentations up to 20 such awards may be given. Only members of the ISCA are eligible for consideration of the award. The upper age limit for eligibility is 30 years as on January 1 of the session year.

The recommendations for presentations are made by each sectional president (there are 13 sections in all) and a screening-cum-selection committee constituted by the executive committee of the ISCA chooses the set which will make the final presentation at the Science Congress and selects the awardees.

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## PAKISTAN

**Junejo Questions India's Need for Nuclear Sub**  
BK271236 Islamabad Domestic Service in English  
1100 GMT 27 Jan 88

[Text] The prime minister, Mr Mohammad Khan Junejo, has reaffirmed Pakistan's desire to have good relations with India, but he has questioned the recent induction of the nuclear submarine in the Indian Navy. He was addressing a meeting of the Central Council of the Pakistan Muslim League in Islamabad today. He said acquisition by India of the submarine, as well as other sophisticated arms, is a serious development. The prime minister pointed out that whenever Pakistan acquired weapons for its genuine defense needs, India made a hue and cry.

Pakistan would, however, never question any such acquisition by India for its genuine defense requirements. He posed the question as to which country represented a threat to India to justify its acquisition of a nuclear submarine. He called upon the superpowers not to provide equipment to India, which creates imbalance of power in the region.

**Junejo Explains Need for Nuclear Technology**  
BK190536 Islamabad Overseas Service in Urdu  
0500 GMT 19 Jan 88

[Text] Prime Minister Mohammad Khan Junejo told a delegation of international physicians for the prevention of nuclear war in Rawalpindi last evening that Pakistan

believes in nuclear nonproliferation and the elimination of nuclear weapons. He expressed hope that India would respond positively to Pakistan's proposal for the establishment of a nuclear-free zone in this region.

The prime minister stated that Pakistan is interested in nuclear technology for meeting its electricity needs and enhancing its agricultural output. Seventy percent of the country's population lives in villages, and the government wants to supply pure drinking water and electricity to them for the welfare of the rural population.

**Junejo on Reasons for Nuclear Power Program**  
BK280911 Islamabad Overseas Service in English  
0800 GMT 28 Jan 88

[Text] The prime minister, Mr Mohammad Khan Junejo, has announced that the petroleum policy has been worked out in broad outline and will be announced shortly. He was inaugurating an international symposium on the importance of petroleum as an energy resource for the future in Islamabad this morning.

The prime minister said the country's population is increasing rapidly and people's minimum requirement of energy has to be provided for. Assuming a modest economic growth rate and an expected population of 150 million by the year 2000, Pakistan would need about 20,000 megawatt of installed capacity as compared to 6,000 megawatt available now. To meet this projected demand, he said, we are building dams and emphasizing the development of coal and power generation, even though, he pointed out, there will be a gap of over 8,000 megawatt. He explained that we either have to import oil or turn to nuclear power for bridging this gap. Even at the current low prices of oil, he said, we find that the costs of nuclear power generation are competitive with those of power from an oil-fired station. Experts agree that this (slump) in the oil market is a transitory phenomenon and the oil prices will touch \$25 a barrel by 1990. That, he emphasized, leaves Pakistan with no other option but return toward nuclear power. That is why, he said, Pakistan has developed a long-term nuclear power program.

**Spokesman on India's Nuclear Subs, Afghanistan**  
BK141619 Islamabad Domestic Service in Urdu  
1500 GMT 14 Jan 88

[Text] Pakistan has expressed concern about India's acquisition of nuclear submarines and other sophisticated weapons. A Foreign Office spokesman told newsmen in Islamabad today that the acquisition of nuclear submarines by India reveals New Delhi's large-scale military preparations for which it has been acquiring missiles, aircraft, artillery, tanks, and warships. This also reflects India's desire to project its power and influence beyond its frontiers, which is incompatible with the idea of keeping the Indian Ocean free from nuclear weapons. The spokesman said that the large-scale buildup in



India's military strength, which is much more than its legitimate defense requirements, is naturally causing concern in neighboring countries.

The spokesman added that the Soviet decision to supply nuclear submarines to India is equally regrettable. These submarines are in addition to the offensive weapons that have been provided to India by the Soviet Union in past years. This unbalanced policy has heightened the threat to other South Asian countries and betrays an extraordinary disregard for the imperatives of peace and security in this region. He stated that the international community has the right to expect the superpowers to display a greater sense of responsibility.

Commenting on the report carried by foreign media quoting Indian sources, the spokesman said that no clash or serious exchange of fire has taken place in the Siachen area or along the line of control in Jammu and Kashmir in the last few days. Whatever was said by India's new general officer commanding in chief about the area is nothing but a gross exaggeration. The spokesman affirmed that Pakistan has not received any suggestions from India for a meeting of commanders, which is held following such incidents.

Responding to a question, the spokesman disclosed that India and Pakistan are in constant touch about the meeting between the two countries' foreign secretaries, and that they have agreed that the two foreign secretaries will hold their meeting as soon as preparations are completed. He said no date has been fixed yet for the meeting between the two countries' defense secretaries.

Pakistan will cooperate fully with Diego Cordovez, the UN secretary general's personal representative on Afghanistan, who is arriving in Islamabad on 20 January. A Foreign Office spokesman said today in Islamabad that Pakistan is very seriously pursuing the preparations for his visit. It is prepared to play its role in connection with the issues related to this problem.

Replying to a question about the formation of a future government in Afghanistan, the spokesman said that Pakistan fully supports this proposal—endorsed by the international community nine times since 1980—which says that it is the right of the Afghan people to determine their own political system without any outside pressure.

The spokesman asserted that Pakistan hopes that the next round of Geneva negotiations will prove successful in connection with a political settlement of the Afghan problem.

Regarding Pakistan's relations with Saudi Arabia, the spokesman stated that these ties are based, as ever, on close, cordial, and friendly cooperation. He noted that a recent visit to Saudi Arabia had provided Prime Minister Mohammad Khan Junejo with an opportunity to exchange views at the highest level.

**Partial Nuclear Test Ban Treaty Said Signed**  
*BK311437 Karachi NAWA-I W'AQT in Urdu*  
24 Jan 88 p 3

[“Editorial Note”: “Nuclear Test Ban Treaty”]

[Text] A telepress conference at the American Center in Karachi has revealed that Pakistan has signed a partial nuclear test ban treaty. The revelation came in the form of an appreciative comment from a U.S. expert to the Government of Pakistan for the latter's initiative in signing the partial nuclear test ban treaty. Pakistan had to face difficulties on an international level on a number of occasions due to the propaganda campaign waged by the Jewish and Hindu lobbies against Pakistan's nuclear research program. The same propaganda campaign and the machinations of these Jewish and Hindu lobbies were also behind constraints that the U.S. Congress had to face in connection with approving economic and military aid for Pakistan last year. Pakistan, however, has always affirmed its principled stand that it will not sign any treaty on nuclear safeguards so long as India will not sign it. The same stand was adopted by Pakistan during all stages of the approval of U.S. aid, and the Reagan administration announced that it accepted Islamabad's stand. Consequently, the U.S. Ambassador to Pakistan said in an interview that President Reagan sees the nuclear issue as a regional problem in South Asia and believes that Pakistan, like India, is not in a position to resolve this problem unilaterally.

Against this backdrop, the report that Pakistan signed the partial nuclear test ban treaty comes as a revelation because it is inconsistent with Pakistan's declared stand. If such a treaty has been signed, the nation needs to be informed of the government's reasons, motives, and policies in this regard. The nation must know whether the signing of this treaty was a precondition for approval of U.S. aid to Pakistan. It would be appropriate for the government to explain this issue in the National Assembly so that the elected representatives of the people can discuss in detail the merits and faults of this treaty, and the nation can be aware of the conditions on which U.S. aid has been granted and the limitations and restrictions under which Pakistan's nuclear research programs and experiments must be undertaken.

**Delhi Notes Negotiations for Nuclear Submarines**  
*BK060344 Delhi Domestic Service in English*  
0240 GMT 6 Feb 88

[Text] Pakistan is reported to be negotiating with a Canadian company for hybrid conventional nuclear submarines. Besides this, Pakistani officials have been discussing with several shipyards in Western Europe for purchase of new and refurbished submarines. Islamabad has also concluded a deal with France for sophisticated surveillance radar system. The radars are to be installed along the border with India from Karachi in the Arabian Sea.

### **Poland Said Ready To Provide Nuclear Technology**

51004719 Lahore *THE PAKISTAN TIMES* in English  
4 Jan 88 p 3

[Text] Lahore, Jan. 3. Poland is ready to provide nuclear technology to Pakistan for power generation.

Mr. T.K. Tawisza, Commercial Counsellor of Poland in Pakistan, disclosed this during a meeting with the President of the Rawalpindi Chamber of Commerce and Industry, Mr. Ikramullah Lone, today. He said that Poland was ready to transfer technology to Pakistan.

Mr. Tawisza said that a buyers mission from Poland will visit Pakistan in March next to explore possibilities for exports. A trade delegation from Pakistan was expected to visit Poland in February next.

He said that Poland was interested in expansion of bilateral trade with Pakistan. The Polish Government was encouraging the private sector and companies in Poland were interested in setting up joint ventures in Pakistan on buy-back arrangements and would offer the facility of suppliers credit for machinery.

The Chamber President, Mr. Ikramullah Lone, said that the business community in Pakistan was keen to expand trade and economic relations with Poland. He said that there were good prospects for export of readymade garments, leather goods and minerals from Pakistan to Poland.

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### **India's Leasing Soviet Submarines Criticized**

BK290915 Islamabad *Domestic Service* in English  
600 GMT 28 Jan 88

[Ghani Erabi commentary]

[Text] Prime Minister Mohammad Khan Junejo has rightly questioned the Indian motive behind acquiring nuclear submarines and the Soviet wisdom in supplying them. Other critics cite the moral duplicity of both in making the deal. Islamabad, which has scrupulously refrained from criticizing India's massive stockpile of conventional weapons in the name of self-defense, has challenged the acquisition of nuclear submarines as far exceeding the requirements of legitimate self-defense.

Nuclear submarines, essentially, are weapons of aggression. They can go anywhere, attack any target. They can hide deep in the ocean, venture far afield, and travel at high speed, say 25 to 30 knots per hour as against the 8 to 10 of the conventional subs. They don't have to call at a port to refuel or surface to recharge their batteries. They can stay under water for any length of time—for months together. The only limit is crew fatigue. To get over that, nuclear submarines of the type India has been furnished by the Soviets carry a crew of 100 to 150 as

against the conventional crew of 40 to 45. These characteristics enable such submarines, identified as the Los Angeles class, to hide safely under the Arctic ice caps with their nuclear missiles awaiting Washington's or Moscow's signal to strike. They are vulnerable only when undergoing refit or repair in submarine pens or tied in harbor for crew relief.

The first of these nuclear submarines were leased out to India on the 5th of this month and according to *INDIA TODAY*, India might get four to six of them from the Soviet Union. Even without the nuclear submarines, India's Navy is the eighth largest in the world equipped with aircraft carriers, Sea King helicopters and Harrier aircraft, frigates, and destroyers capable of holding its own against all its neighbors put together. Now with the nuclear submarines, the Indian Ocean will be reduced to the status of an Indian lake.

The Soviet Union clearly is answerable for providing India the wherewithal with which to threaten the sovereignty and territorial integrity of not only its immediate neighbors but of all Indian ocean states, including Malaysia and Indonesia, Iran and Arabia, and countries lining Africa's eastern seaboard besides the island states dotting the sea. Above all, it will give a fillip to the nuclearization of the Indian Ocean, jeopardizing the safety of the world's largest concentration of human population. What makes it doubly ironic is the fact that the threat results from the deal between two countries making the loudest protestations about keeping South Asia and the Indian Ocean free of nuclear menace. India, which has been objecting even to nuclear-powered ships passing through the Indian Ocean, will now be permanently stationing nuclear submarines smack in the middle of it, and the Soviet Union, which has been threatening Pakistan with dire consequences even for seeking nuclear capability, is now itself handing over fully-operational nuclear reactors to a country that has neither signed the nonproliferation treaty nor is submitting itself to international safeguards. The Soviet lease out of nuclear submarines to India is a clear violation of their commitment to nuclear nonproliferation and is public confirmation of moral duplicity on the part of both.

### **Paper Condemns India's Nuclear Submarine Lease**

BK261507 Karachi *DAWN* in English 19 Jan 88 p 7

[Editorial: "Rent-a-Nuclear Submarine"]

[Text] After India's "peaceful" nuclear explosion of 1974 comes another nuclear first from the same quarter: a nuclear submarine on lease from the Soviet Union, with two more to follow. This is no joke, however. Beyond strengthening the Indian Navy it upsets the rules of the naval game in the Indian Ocean. A fundamentally new factor has been injected into the region as the Indian Navy, never very small, sees its war-making potential enhanced by this latest acquisition. As such, it is bound to add to the fears and suspicions of India's neighbours



who have never found it easy to reconcile New Delhi's peaceful professions with its rather more belligerent deeds. As the Foreign Office has pointed out rightly, this move is inconsistent with the aim of denuclearising the Indian Ocean and is all the more disquieting in that the nuclear propulsion system installed in these submarines would not be subjected to any safeguards. By introducing in effect a new weapons system in South Asia, the Soviet Union is contributing to the intensification of the arms race in this region. As India goes about arming itself in this fashion, its neighbours would inevitably be under pressure to take countervailing steps. This scarcely augurs well for peace in the region. Nor does it quite square with the global efforts currently underway to curb the menace of nuclear arms.

At any rate, it is for India to take note of the double standards it brings to bear upon the question of an arms race in South Asia. Any effort by Pakistan to meet its legitimate defence needs draws the most shrill protests from it. But India itself has never felt under any restriction to get what it wants for what is now the third largest military force in the world. It would have been something had this arms drive been propelled by ordinary defence requirements. But in India's case the ambition to be a regional power dominates its defence thinking and induces an insatiable appetite for expensive and sophisticated weaponry. The leasing of three nuclear submarines from the Soviet Union is part of the same pattern. All the same, it is an unwise and a dangerous move which is sure to accentuate regional fears and intensify the search to balance the weight of India's military acquisitions. It is a fit subject to be unequivocally condemned by all states interested in the development of peaceful relations in South Asia.

**Commentary Criticizes India's Nuclear Stand**  
*BK200614 Islamabad Domestic Service in English*  
1600 GMT 19 Jan 88

[Ghani Erabi commentary]

[Text] Prime Minister Mohammad Khan Junejo has reaffirmed Pakistan's renunciation of nuclear weapons and expressed the hope India would respond positively to Islamabad's proposals for declaring and making South Asia effectively a nuclear-free zone. He spelled out the

proposals at a meeting in Islamabad yesterday with the delegation of International Physicians for the Prevention of Nuclear Weapons [as heard].

Islamabad's proposals for joint or simultaneous action in curbing nuclear proliferation in the subcontinent presented through the United Nations are so clear and credible that both the U.S. Administration and Congress have urged India at least to consider them dispassionately or offer counterproposals of her own. But India has done neither, contending she cannot be equated with Pakistan. However, she has never explained why not.

The modern world cannot operate except on the basis of sovereign equality of nations and whatever religious commitment India may have to a caste system at home, it cannot operate abroad. It is not acceptable to the world at large. The U.S. Senate Appropriations Committee recently made that abundantly clear and both the Senate and the House, in the act of resuming aid to Pakistan, have prescribed the principle that the prohibitions of the nonproliferation law apply either to both India and Pakistan or to none. The principle has just been endorsed by an 18-member task force of the Carnegie Endowment for International Peace.

As reported by the Indian radio itself this week, the task force experts have brought India and Pakistan at par on the question of regional test ban and nuclear site inspection and has urged the aid-to-India consortium to exercise equal influence on India by linking it to nuclear nonproliferation. Another part of the Carnegie study says while Pakistan may barely manage to produce 15 to 30 bombs by 1991, India has the capacity to manufacture at least 115 and she possesses far more numerous deep penetration aircraft capable of delivering the bomb.

In an early study of the smaller nuclear forces, Carnegie scholar Dr Spector recalled the Indian prime minister's LE MONDE interview that India could put together a nuclear bomb within months if not weeks of Pakistan producing one. From this, the U.S. specialists concluded that India must have all the components of a bomb already lined up and said all this fueled the suspicion that India already was stockpiling nuclear bombs.

India's latest action in acquiring nuclear submarines from the Soviet Union with their nuclear reactors uncovered by any international inspection has caused a further setback to the dream of making the region a nuclear-free zone.

**Radio Charges FRG, Belgium Nuclear Material Transfer 'Illegal'**

*OW232326 Moscow Radio Peace and Progress in Mandarin to Asia-Pacific Region 1300 GMT 23 Jan 88*

[Text] Because of the illegal transfer of nuclear materials and technology from Belgium and the FRG to Pakistan, which is eager to have nuclear weapons, a tumult broke out a few days ago.

According to newspapers, a Belgian nuclear products company and a transnational FRG nuclear products company secretly sold enriched uranium to Pakistan. Some political activists think that only if their governments failed to exercise strict control could these two companies have done so. According to Belgian newspapers, the Belgian Foreign Ministry issued a permit for the export of the nuclear product. For this reason, the Foreign Ministry should bear the same responsibility as the Belgian nuclear products company. This is indeed the evidence of the crime.

The supply of nuclear fuel to Pakistan by Belgium and West Germany violates the international treaty on nuclear non-proliferation. Will fines be imposed on the companies that did business with Pakistan? Will they be banned or restricted from doing business again? Will [word indistinct] be punished? It is very possible that all efforts will be made to quietly put an end to the tumult. Pakistan previously made repeated attempts to buy components of nuclear weapons. The attempts failed, but those involved in the deals suffered only slight setbacks. For instance, in the summer of 1984, Nazir Vaid, a Pakistani who attempted to smuggle [words indistinct—probably referring to krytons] of atomic bombs out of the United States, was arrested in Houston. Later, his case was closed without being officially settled. Vaid was soon returned to Pakistan after the U.S. Congress howled awhile to express its displeasure with Islamabad. In July 1987, Parvez, a Canadian citizen born in Pakistan, was arrested in Philadelphia. He attempted bribery in order to smuggle out of the United States 25 tons of special steel for building nuclear fuel plants. His case also ended without being officially settled. It did not hurt U.S.-Canadian relations. Pakistan's attempt to secretly acquire from the United States the technology and information for making atomic bombs did not affect Pakistani-U.S. relations,

either. It is even worse that this not only violates the principles of the international pact on nuclear non-proliferation but also violates the laws of the United States.

It is known to all that the laws of the United States forbid the United States to provide aid to any nation that develops nuclear weapons. Why does the United States adopt a liberal attitude toward Islamabad by repeatedly trying to evade the provisions of the world's treaty on the non-proliferation of nuclear weapons? People still remember that when Japan's Toshiba Company sold several machine tools to the Soviet Union for the modernization of Soviet submarines, Washington dealt Toshiba a head-on blow. Toshiba was accused of and punished for committing the crime of violating Cocom restrictions and evading its responsibilities. Actually, the Toshiba Company has been squeezed out of the socialist countries' market. The Soviet Union, China, and other countries that signed contracts with Toshiba have suffered losses. Yet when a nuclear products company in Belgium and another transnational nuclear products company in the FRG are involved in the case of selling nuclear fuel to Pakistan, Washington acts as if nothing has happened. Could it be possible that Washington disbelieves that Pakistan can produce nuclear weapons? Not really. In answering a question raised by a reporter of the British newspaper THE OBSERVER, A.Q. Khan, Islamabad's nuclear weapons expert, said: Actually Pakistan already has nuclear bombs. The United States realizes this. It looks like the U.S. rightists are turning a blind eye to Pakistan's live nuclear bombs for their own strategic interests. Washington's action is aimed at continuously utilizing Pakistan as a base for the Afghan counterrevolutionaries and as a means to apply pressure to India, which seeks to adopt an independent diplomatic policy toward the United States. Right now, the general public in various countries in the Asia-Pacific region, where antinuclear sentiments are rising each passing day, are disturbed by the U.S.-Pakistani military agreement. Their feelings are understandable. At a time when mankind may enter a new nuclear-free era after the signing of the Soviet-U.S. agreement on intermediate-range nuclear forces, the general public in the Asia-Pacific region has regarded the action taken by the United States and Pakistan as a challenge to the general public, who advocates the cause of peace. They believe that those who try to satisfy Islamabad's nuclear ambitions today have set a new obstacle on the road leading to a nuclear free world.

## FEDERAL REPUBLIC OF GERMANY

### Violation of Treaty on Uranium Shipment Denied

LD071109 Hamburg DPA in German  
1100 GMT 7 Feb 88

[Excerpt] Bonn (DPA)—The Federal Environment and Research Ministries on Sunday in Bonn rejected accusations to the effect that the Nuclear Nonproliferation Treaty had been violated by the supply of uranium to Argentina with the approval of Federal German authorities.

The supply of natural uranium and slightly enriched uranium by the Hanau Reaktor-Brennelemente Union (RBU) in April 1985 to Argentina via Bremen "took place in full accordance with the regulations of the Nuclear Nonproliferation Treaty and international supervision of nuclear material," ministers Klaus Toepfer and Heinz Reisenhuber affirmed in a joint statement. All approvals necessary for the transport were received.

### IAEA Rejects Dereliction of Duty Accusation

AU101048 Vienna Television Service in German  
1830 GMT 18 Jan 88

[Herbert Hamersky report on nuclear scandal in the FRG, including IAEA news conference in Vienna on 18 January—videotaped; statements by John Jennekens, IAEA Safeguard Department head, in English with superimposed German translation, in quotation marks]

[Excerpts] If the reports in DER SPIEGEL are correct, what has become known in the FRG and Belgium about the nuclear scandal might be only the tip of the

iceberg—of a highly explosive iceberg, because the business with nuclear materials is out of control, the article says.

DER SPIEGEL states that whatever illegal business has been done, has been possible only because the Vienna-based IAEA is not able to check on everything in a really thorough way, as is its job.

Today in Vienna's International Center, John Jennekens the head of the IAEA's Safeguard Department that is responsible for checks on nuclear installations, defended the organization: "We are entirely confident that our reports were correct and that no significant amounts of nuclear materials have been delivered. This is a misinterpretation by DER SPIEGEL, because the material delivered is not sufficient to build a bomb and all material has been properly accounted for."

DER SPIEGEL also notes that the IAEA does not have enough people to check on everything.

"This organization, like all international organizations, has financial problems. To date, we have been very successful. This need not remain so because our workload is increasing."

Uncertainty and fear are justified, because the IAEA can check only on those countries that are members.

"Every statement that has been made about nuclear material here refers only to material that is under our control."

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**DATE FILMED**

15 March 1988